

<b>Started on</b>	Wednesday, 19 June 2024, 12:16 PM
<b>State</b>	Finished
<b>Completed on</b>	Wednesday, 19 June 2024, 1:57 PM
<b>Time taken</b>	1 hour 41 mins
<b>Marks</b>	37.58/75.00
<b>Grade</b>	20.04 out of 40.00 (50.11%)

**Question 1**

Correct

Mark 1.00 out of 1.00

The root directory of the disk should be located:

- a. in a place hard-coded in the structures of the operating system
- b. in a place designated by the data structure in a fixed location on the disk ✓
- c. at a fixed address in main memory
- d. in a permanent place on the disk

The correct answer is: in a place designated by the data structure in a fixed location on the disk

**Question 2**

Partially correct

Mark 0.67 out of 1.00

Twins algorithm:

Select one or more:

- a. Causes external fragmentation ✓
- b. Causes less fragmentation than static division into equal blocks
- c. Causes internal fragmentation ✓

Twoja odpowiedź jest częściowo poprawna.

You have correctly selected 2.

The correct answers are: Causes internal fragmentation, Causes external fragmentation, Causes less fragmentation than static division into equal blocks

**Question 3**

Correct

Mark 1.00 out of 1.00

The kernel (microkernel) is responsible for:

Select one or more:

- a. task control ✓
- b. memory allocation and freeing
- c. interrupt handling (at the elementary level, then they are passed on to other layers). ✓
- d. synchronization of processes and devices with processes ✓

Twoja odpowiedź jest poprawna.

The correct answers are: task control, synchronization of processes and devices with processes, interrupt handling (at the elementary level, then they are passed on to other layers).

**Question 4**

Partially correct

Mark 0.67 out of 1.00

In UNIX, access rights are specified:

Select one or more:

- a. Separately for write, read and execute/search ✓
- b. Separately for the user, the group to which the user belongs and for all others ✓
- c. Individually for each file
- d. At the same time, for all files in a given directory owned by the user

Twoja odpowiedź jest częściowo poprawna.

You have correctly selected 2.

The correct answers are: Individually for each file, Separately for the user, the group to which the user belongs and for all others, Separately for write, read and execute/search

**Question 5**

Incorrect

Mark 0.00 out of 1.00

The logical address is also:

Select one or more:

- a. Relative address ✗
- b. Effective address ✓
- c. Physical address ✗
- d. Absolute address

Twoja odpowiedź jest niepoprawna.

The correct answer is: Effective address

**Question 6**

Incorrect

Mark 0.00 out of 1.00

Internal fragmentation consists in:

Select one or more:

- a. The program does not use all the memory allocated to it
- b. Dividing the memory allocated to the program into a data area and a code area
- c. Free memory blocks between allocated blocks ✗
- d. Discontiguous file allocation on disk

Twoja odpowiedź jest niepoprawna.

The correct answer is: The program does not use all the memory allocated to it

**Question 7**

Correct

Mark 1.00 out of 1.00

Which scheduling is used to organize concurrency?

Select one or more:

- a. medium-term
- b. short-term ✓
- c. preempting
- d. long-term

Twoja odpowiedź jest poprawna.

The correct answer is: short-term

**Question 8**

Incorrect

Mark 0.00 out of 1.00

Which of the following few common services can be partially provided by software other than the operating system?

- a. I/O operations ✗
- b. Manipulating the file system ✓
- c. Security and protection
- d. Running programs

The correct answers are: Security and protection, Manipulating the file system

**Question 9**

Correct

Mark 1.00 out of 1.00

The return from interrupt instruction:

Select one or more:

- a. restores general purpose registers
- b. restores the interrupt vector ✓
- c. always jumps to the process that was interrupted
- d. restores the stack pointer

Twoja odpowiedź jest poprawna.

The correct answer is: restores the interrupt vector

**Question 10**

Correct

Mark 1.00 out of 1.00

Operation V on a raised binary semaphore:

Select one or more:

- a. It is stored in order to be able to perform as many operations P as there were V
- b. It does not change the value of the semaphore ✓
- c. Increases semaphore value by 1

Twoja odpowiedź jest poprawna.

The correct answer is: It does not change the value of the semaphore

**Question 11**

Incorrect

Mark 0.00 out of 1.00

The effective address is at the same time:

Select one or more:

- a. relative address
- b. indirect address ✗
- c. logical address
- d. physical address

Twoja odpowiedź jest niepoprawna.

The correct answer is: logical address

**Question 12**

Correct

Mark 1.00 out of 1.00

The hardware resources of a computer system are:

Select one or more:

- a. Windows on the screen
- b. Peripheral devices ✓
- c. Processor time ✓
- d. Primary memory ✓

Twoja odpowiedź jest poprawna.

The correct answers are: Processor time, Primary memory, Peripheral devices

**Question 13**

Partially correct

Mark 0.50 out of 1.00

The following paging exceptions allow for returning to the program after they occur:

Select one or more:

- a. attempting to write to a write-protected frame
- b. attempt to read from the frame storing the code
- c. page fault ✓
- d. interrupt on write (IOW)

Twoja odpowiedź jest częściowo poprawna.

You have correctly selected 1.

The correct answers are: page fault, interrupt on write (IOW)

**Question 14**

Incorrect

Mark 0.00 out of 1.00

How does the operating system call the task completion subroutine?

4. sets the trace in the terminating subroutine to the current position ✗
2. builds the frame of the terminating subroutine on the task stack ✗
1. builds an interrupt vector on the system stack pointing to the terminating subroutine code ✗
3. recreates the context programmatically and executes the IRET instruction ✗

Twoja odpowiedź jest niepoprawna.

The correct answer is: 4. → recreates the context programmatically and executes the IRET instruction, 2. → sets the trace in the terminating subroutine to the current position, 1. → builds the frame of the terminating subroutine on the task stack, 3. → builds an interrupt vector on the system stack pointing to the terminating subroutine code

**Question 15**

Correct

Mark 1.00 out of 1.00

Dynamic relocation requires the use of:

Select one or more:

- a. limit register
- b. status register
- c. base register (DATUM) ✓
- d. program counter

Twoja odpowiedź jest poprawna.

The correct answer is: base register (DATUM)

**Question 16**

Incorrect

Mark 0.00 out of 1.00

What mechanism is used to desynchronize processes with different relative speeds?

Select one or more:

- a. buffer
- b. preempting
- c. interrupts ✗
- d. scheduling

Twoja odpowiedź jest niepoprawna.

The correct answer is: buffer

**Question 17**

Correct

Mark 1.00 out of 1.00

Which of the following information is stored on task switching?

- a. I/O status information ✓
- b. Contents of datum, limit and other registers inaccessible to the program ✓
- c. scheduler data ✓
- d. Contents of general purpose registers, program counter, and similar registers available to the program ✓

The correct answers are: I/O status information, scheduler data, Contents of datum, limit and other registers inaccessible to the program, Contents of general purpose registers, program counter, and similar registers available to the program

**Question 18**

Correct

Mark 1.00 out of 1.00

The direct resume rule means that:

Select one or more:

- a. The resuming process gets a critical region after the resumed process exits the critical region
- b. The resuming process applies for the critical region just like other processes waiting to enter the critical region ✓
- c. The resuming process loses the critical region ✓

Twoja odpowiedź jest poprawna.

The correct answers are: The resuming process loses the critical region, The resuming process applies for the critical region just like other processes waiting to enter the critical region

**Question 19**

Partially correct

Mark 0.50 out of 1.00

Static relocation is performed by:

- a. Special registers (DATUM)
- b. Loader ✓
- c. Compiler
- d. Segment descriptors

The correct answers are: Compiler, Loader

**Question 20**

Partially correct

Mark 0.50 out of 1.00

For address translation, the following is used:

Select one or more:

- a. reference and protection bits
- b. translation register
- c. associative translation buffer ✓
- d. index table

Twoja odpowiedź jest częściowo poprawna.

You have correctly selected 1.

The correct answers are: index table, associative translation buffer

**Question 21**

Correct

Mark 1.00 out of 1.00

The system stack must provide space for:

Select one or more:

- a. CPU registers
- b. Processor registers in as many copies as there are devices in the system +1
- c. Processor registers in as many copies as there are interrupt lines +1 ✓
- d. Processor registers in as many copies as there are interrupt lines and possible software interrupts

Twoja odpowiedź jest poprawna.

The correct answer is: Processor registers in as many copies as there are interrupt lines +1

**Question 22**

Correct

Mark 1.00 out of 1.00

Connection with segmentation consists in:

Select one or more:

- a. The use of a segment table or pool of segment registers treated as an additional, superior level of paging ✓
- b. Dividing pages into segments
- c. Generating a "frame error" interrupt when the frame containing the page does not belong to the current segment
- d. Identifying segments with pages



Twoja odpowiedź jest poprawna.

The correct answer is: The use of a segment table or pool of segment registers treated as an additional, superior level of paging

**Question 23**

Incorrect

Mark 0.00 out of 1.00

What type of code can multiple processes execute simultaneously?

Select one or more:

- a. reentrant ✓
- b. binary
- c. self-modifying
- d. dynamically relocated ✗

Twoja odpowiedź jest niepoprawna.

The correct answer is: reentrant

**Question 24**

Incorrect

Mark 0.00 out of 1.00

a page fault interrupt is issued when:

Select one or more:

- a. the program is accessing a page that is not in the cache ✗
- b. the program accesses the page
- c. the program accesses a page that is not in the primary memory ✓
- d. an error has occurred on the current page

Twoja odpowiedź jest niepoprawna.

The correct answer is: the program accesses a page that is not in the primary memory

**Question 25**

Correct

Mark 1.00 out of 1.00

The scheduler decisions take the form:

Select one or more:

- a. change from ready to active state ✓
- b. change from waiting to active state
- c. change from active to ready state
- d. change from waiting to ready state

Twoja odpowiedź jest poprawna.

The correct answer is: change from ready to active state

**Question 26**

Correct

Mark 1.00 out of 1.00

Using the Test-And-Set instruction in synchronization:

Select one or more:

- a. Requires organizing inactive waiting in queues
- b. It requires processes to actively wait ✓
- c. Requires an explicit relinquishment of the processor to another process
- d. Stops the processor if 0 is read

Twoja odpowiedź jest poprawna.

The correct answer is: It requires processes to actively wait

**Question 27**

Correct

Mark 1.00 out of 1.00

Address translation aims to:

Select one or more:

- a. converting a physical address to a virtual one
- b. converting a virtual address to a physical one ✓
- c. detecting the phenomenon of locality of references
- d. Generating a "frame error" interrupt when the page is out of memory

Twoja odpowiedź jest poprawna.

The correct answer is: converting a virtual address to a physical one

**Question 28**

Incorrect

Mark 0.00 out of 1.00

System/user threads:

Select one or more:

- a. User-level threads share the same stack. ✗
- b. User-level threads share the same execution context.
- c. System level thread descriptors are stored in the operating system kernel. ✓

Twoja odpowiedź jest niepoprawna.

The correct answers are: System level thread descriptors are stored in the operating system kernel., User-level threads share the same execution context.

**Question 29**

Incorrect

Mark 0.00 out of 1.00

The program must be specially compiled to run in paged memory.

- True ✗
- False

The correct answer is 'False'.

**Question 30**

Incorrect

Mark 0.00 out of 1.00

The mechanism for moving programs between primary memory and mass storage is called:

- a. sweeping
- b. swapping ✗
- c. leaching
- d. leading out

The correct answer is: sweeping

**Question 31**

Incorrect

Mark 0.00 out of 1.00

The internal state of the file system layer is available for:

- a. Applications ✗
- b. User programs ✗
- c. OS kernel ✓
- d. Program supervisor layer

The correct answers are: OS kernel, Program supervisor layer

**Question 32**

Correct

Mark 1.00 out of 1.00

Sequence of actions when starting a new task:

1. filling in the descriptor in the kernel ✓
2. memory allocation if this is the first task of the program ✓
3. initialize the stack, fill the first frame ✓
4. instruction to transfer control to the task ✓

Twoja odpowiedź jest poprawna.

The correct answer is: 1. → filling in the descriptor in the kernel, 2. → memory allocation if this is the first task of the program, 3. → initialize the stack, fill the first frame, 4. → instruction to transfer control to the task

**Question 33**

Correct

Mark 1.00 out of 1.00

The page index table address is stored in:

Select one or more:

- a. program counter
- b. page register
- c. stack pointer
- d. page table base register ✓

Twoja odpowiedź jest poprawna.

The correct answer is: page table base register

**Question 34**

Incorrect

Mark 0.00 out of 1.00

Is IOW bit:

Select one or more:

- a. protection bit
- b. reference bit ✗
- c. enable bit

Twoja odpowiedź jest niepoprawna.

The correct answer is: protection bit

**Question 35**

Correct

Mark 1.00 out of 1.00

When starting a program, how is control passed to it from the operating system?

Select one or more:

- a. extracode
- b. jump with trace
- c. jump
- d. return from interrupt handler IRET ✓

Twoja odpowiedź jest poprawna.

The correct answer is: return from interrupt handler IRET

**Question 36**

Incorrect

Mark 0.00 out of 1.00

The software resources of a computer system are:

Select one or more:

- a. Files ✓
- b. Buffers ✓
- c. Semaphores ✓
- d. Primary memory ✗

Twoja odpowiedź jest niepoprawna.

The correct answers are: Files, Buffers, Semaphores

**Question 37**

Correct

Mark 1.00 out of 1.00

The main function of shared memory is:

- a. inter-process communication ✓
- b. use working memory efficiently
- c. inter-process synchronization
- d. inter-process scheduling

The correct answer is: inter-process communication

**Question 38**

Incorrect

Mark 0.00 out of 1.00

Which of the following facilities or abilities are required to provide mutual exclusion support?

Select one or more:

- a. The relative speeds of the tasks must be taken into account.
- b. Task scheduling must be considered. ✗
- c. A task that is performed outside the critical section must not affect the behavior of a task in the critical section.
- d. The task stays in its critical section only for a finite amount of time. ✓

Twoja odpowiedź jest niepoprawna.

The correct answers are: A task that is performed outside the critical section must not affect the behavior of a task in the critical section., The task stays in its critical section only for a finite amount of time.

**Question 39**

Incorrect

Mark 0.00 out of 1.00

Allocation unit for file storage:

- a. must be constant across the disk partition
- b. may vary between partitions ✓
- c. may differ between files in a partition
- d. is any integer multiple of a sector (>0) ✗

The correct answers are: must be constant across the disk partition, may vary between partitions

**Question 40**

Incorrect

Mark 0.00 out of 1.00

Frame protection bits:

Select one or more:

- a. must be available for group clear
- b. must be readable ✗
- c. must be group readable
- d. must be available for writing ✓

Twoja odpowiedź jest niepoprawna.

The correct answer is: must be available for writing

**Question 41**

Correct

Mark 1.00 out of 1.00

The following situations cause "error" exceptions (processor internal interrupts)

Select one or more:

- a. extracode
- b. illegal instruction ✓
- c. instruction legal but prohibited in user mode ✓

Twoja odpowiedź jest poprawna.

The correct answers are: illegal instruction, instruction legal but prohibited in user mode

**Question 42**

Correct

Mark 1.00 out of 1.00

Precise interrupts are:

Select one or more:

- a. unblocked only in a stable state between the execution of successive instructions
- b. only issued in a stable state between executions of subsequent instructions
- c. accepted only in a stable state between the execution of successive instructions ✓
- d. transferred only in a stable state between the execution of successive instructions instrukcji

Twoja odpowiedź jest poprawna.

The correct answer is: accepted only in a stable state between the execution of successive instructions

**Question 43**

Correct

Mark 1.00 out of 1.00

What mechanism is used to preserve the states of preempted tasks?

- a. time slice
- b. batch work
- c. task period
- d. context switch ✓

The correct answer is: context switch

**Question 44**

Partially correct

Mark 0.25 out of 1.00

In the sweeping mechanism, a program should be loaded into memory when:

Select one or more:

- a. The programmatical condition for the continuation of the program was met by another program
- b. The device the program was waiting for has freed up ✓
- c. The time the program was supposed to be "wake up" has occurred
- d. The data transmission to the printer, ordered by the program, has ended

Twoja odpowiedź jest częściowo poprawna.

You have correctly selected 1.

The correct answers are: The data transmission to the printer, ordered by the program, has ended, The programmatical condition for the continuation of the program was met by another program, The device the program was waiting for has freed up, The time the program was supposed to be "wake up" has occurred

**Question 45**

Correct

Mark 1.00 out of 1.00

With indulgent scheduling, once a CPU is allocated to a task, the task keeps it until:

Select one or more:

- a. transition a task from the ready state to the active state
- b. releasing the processor by the task ✓
- c. task termination ✓
- d. transition a task from the active state to the ready state

Twoja odpowiedź jest poprawna.

The correct answers are: task termination, releasing the processor by the task

**Question 46**

Correct

Mark 1.00 out of 1.00

The thread is also called:

- a. heavy process
- b. lightweight process ✓
- c. data process
- d. overlay process

The correct answer is: lightweight process

**Question 47**

Incorrect

Mark 0.00 out of 1.00

In UNIX, access rights are attributes:

Select one or more:

- a. An entry in the I-node table
- b. User descriptor
- c. A directory entry for a file ✗
- d. A special table specifying access rights

Twoja odpowiedź jest niepoprawna.

The correct answer is: An entry in the I-node table

**Question 48**

Partially correct

Mark 0.50 out of 1.00

Discontinuous allocation is the result of:

Select one or more:

- a. compacting
- b. paging
- c. reloaction
- d. segmentation ✓

Twoja odpowiedź jest częściowo poprawna.

You have correctly selected 1.

The correct answers are: paging, segmentation

**Question 49**

Incorrect

Mark 0.00 out of 1.00

The behavior of the exchange algorithm opposite to that expected with the measures taken is called:

Answer: the exchange algorithm opposite to that expected with the measures taken is referred to as “sun” ✗

The correct answer is: anomaly

**Question 50**

Partially correct

Mark 0.33 out of 1.00

Which of the following interrupts a running process?

- a. Hardware interrupt
- b. Timer interrupts ✓
- c. Scheduler
- d. Power fail interrupt

The correct answers are: Hardaware interrupt, Timer interrupts, Power fail interrupt

**Question 51**

Correct

Mark 1.00 out of 1.00

Scheduling aims to optimize:

Select one or more:

- a. processor utilization ✓
- b. reaction time ✓
- c. wait time ✓
- d. system throughput ✓

Twoja odpowiedź jest poprawna.

The correct answers are: processor utilization, system throughput, wait time, reaction time

**Question 52**

Correct

Mark 1.00 out of 1.00

The multi-level interrupt controller includes:

Select one or more:

- a. The register of interrupt being serviced
- b. Priority encoder ✓
- c. Individual interrupt mask ✓
- d. Collective interrupt mask ✓

Twoja odpowiedź jest poprawna.

The correct answers are: Collective interrupt mask, Individual interrupt mask, Priority encoder

**Question 53**

Partially correct

Mark 0.50 out of 1.00

Using Test-And-Set or Compare-And-Swap in synchronization:

Select one or more:

- a. Stops the processor if 0 is read
- b. Requires organizing inactive waiting in queues
- c. It can only be applied in systems with shared memory
- d. It requires processes to actively wait ✓

Twoja odpowiedź jest częściowo poprawna.

You have correctly selected 1.

The correct answers are: It requires processes to actively wait,  
It can only be applied in systems with shared memory

**Question 54**

Correct

Mark 1.00 out of 1.00

Scheduling algorithms can be:

- a. indulgent ✓
- b. preemptive ✓
- c. interrupting
- d. term changing

The correct answers are: indulgent, preemptive

**Question 55**

Incorrect

Mark 0.00 out of 1.00

The following situations trigger exceptions (processor internal interrupts) of the "error" type:

Select one or more:

- a. an attempt to write to the page for which the "read only" bit was set ✓
- b. memory reference beyond limit register value ✓
- c. memory reference in the area of the page that is not in memory ✗
- d. a reference to memory that is not in the address space ✓

Twoja odpowiedź jest niepoprawna.

The correct answers are: a reference to memory that is not in the address space, memory reference beyond limit register value, an attempt to write to the page for which the "read only" bit was set

**Question 56**

Partially correct

Mark 0.67 out of 1.00

What is included in the context that must be saved for a synchronous (inter-instruction) precision interrupt?

Select one or more:

- a. instruction register
- b. collective of individual interrupt mask
- c. program counter ✓
- d. general purpose registers ✓

Twoja odpowiedź jest częściowo poprawna.

You have correctly selected 2.

The correct answers are: general purpose registers, program counter, collective of individual interrupt mask

**Question 57**

Partially correct

Mark 0.50 out of 1.00

In a FAT-based disk system (without sharing allocation units by files), the number of files is directly limited by:

Select one or more:

- a. The size of the disk space
- b. Allocation unit size
- c. The number of bits of the field describing the size of the file
- d. The number of bits of the disk address
- e. FAT table size ✓

Twoja odpowiedź jest częściowo poprawna.

You have correctly selected 1.

The correct answers are: FAT table size, The size of the disk space

**Question 58**

Incorrect

Mark 0.00 out of 1.00

Which of the following memory allocation schemes cause external fragmentation?

- a. Sweeping
- b. Segmentation
- c. Paging
- d. Multiple contiguous fixed partitions of equal size ✗

The correct answers are: Segmentation, Sweeping

**Question 59**

Incorrect

Mark 0.00 out of 1.00

The sweeping mechanism consists in:

Select one or more:

- a. Loading pages into the primary memory and sending them to the disk
- b. Loading segments into primary memory and sending them to disk
- c. Merging adjacent free memory blocks
- d. Moving programs around in memory to eliminate fragmentation ✗

Twoja odpowiedź jest niepoprawna.

The correct answer is: Loading segments into primary memory and sending them to disk

**Question 60**

Correct

Mark 1.00 out of 1.00

Having two-level page index tables:

Select one or more:

- a. the content of a level I table element is added to the content of a level II table element
- b. the content of a level I table element points to a level II table ✓
- c. the content of the level I table element is concatenated (combined) with the content of the level II table element
- d. the content of a level I table element is an index in a level II table

Twoja odpowiedź jest poprawna.

The correct answer is: the content of a level I table element points to a level II table

**Question 61**

Incorrect

Mark 0.00 out of 5.00

What is the average time in the system for tasks in the batch, using SJF algorithm?

task	1	2	3	4
processing time	3.3	6.8	2.4	1.2

Answer:

3.8



The correct answer is: 6.3

**Question 62**

Incorrect

Mark 0.00 out of 5.00

In RAID 4, data is placed in Strips that are "scattered" over the data disks, so that each subsequent strip is on the next data disk, modulo the number of disks. For this, there is a parity disk that holds the parity bits of zeroth bits, first bits, second bits, etc., equal-numbered strips divided by the number of data disks, for example, strips 0-3, 4-7, 8-11, etc.:



the start of strips 0,1,2,3 looks like this:

1	1	1	0	0	Parity disk
0	0	0	0	0	Disk 3
1	0	0	1	0	Disk 2
1	0	1	0	1	Disk 1
0	1	1	0	0	Disk 0

In the parity strip, the values are placed so that the parity bit keeps the corresponding strip bits 0-3 even.

Disk 3 has been damaged and reads only 0. After replacing the disk with a new one, what values should be put in the strip on disk 3?

Answer:  ×

The correct answer is: 10111

**Question 63**

Correct

Mark 5.00 out of 5.00

The virtual address consists of 8b page number and 8b offset. The page index table is shown below (index, content). For decimal address 384, binary 0000 0001 1000 0000, enter the physical address in the form: frame number.offset (as decimal numbers, offset in 3 digits). For example, for a physical address consisting of frame 0 and offset 18, specify 0.018. If there is no physical address for the given virtual address, then -1 should be specified.

7	12
6	-1
5	7
4	4
3	9
2	-1
1	3
0	2

Answer: 3.128 

The correct answer is: 3.128

<b>Started on</b>	Thursday, 27 June 2024, 12:36 PM
<b>State</b>	Finished
<b>Completed on</b>	Thursday, 27 June 2024, 1:48 PM
<b>Time taken</b>	1 hour 11 mins
<b>Marks</b>	53.58/75.00
<b>Grade</b>	22.86 out of 32.00 ( <b>71.44%</b> )

**Question 1**

Correct

Mark 1.00 out of 1.00

Which swapping algorithms can be implemented based on hardware support in the form of a collective reading of reference bits and collective clearing of these bits?

Select one or more:

- a. LFU ✓
- b. FIFO
- c. LRU ✓
- d. optimal
- e. second chance
- f. NRU
- g. working set clock
- h. no algorithm
- i. working set

Twoja odpowiedź jest poprawna.

The correct answers are: LRU, LFU

**Question 2**

Correct

Mark 1.00 out of 1.00

Consider the following sequence of address references:

123, 215, 600, 1234, 76, 96.

If the page size is 100, the order of page references is as follows:

- a. 1,2,6,12
- b. 0,2,6,12,0,0
- c. 1,2,6,12,0,0 ✓
- d. 12,21,60,123,7,9

The correct answer is: 1,2,6,12,0,0

**Question 3**

Correct

Mark 1.00 out of 1.00

Imprecise interrupts can be handled:

Select one or more:

- a. only when the program allows accepting interrupts
- b. after clearing the pipeline from the instructions ✓
- c. after saving the full state of the pipeline ✓
- d. when new instructions are suspended to be fetched into the pipeline

Twoja odpowiedź jest poprawna.

The correct answers are: after clearing the pipeline from the instructions, after saving the full state of the pipeline

**Question 4**

Correct

Mark 1.00 out of 1.00

Address translation mechanism:

Select one or more:

- a. concatenates the frame number and page number
- b. concatenates the page number and page offset
- c. concatenates the frame number and offset on the page ✓
- d. adds the frame number to the page number

Twoja odpowiedź jest poprawna.

The correct answer is: concatenates the frame number and offset on the page

**Question 5**

Correct

Mark 1.00 out of 1.00

FIRST-FIT algorithm:

Select one or more:

- a. Requires an ascending sorting of the list of free blocks
- b. Avoids external fragmentation
- c. Causes external fragmentation ✓
- d. It allows for fast determining whether there is a free block of the required size

Twoja odpowiedź jest poprawna.

The correct answer is: Causes external fragmentation

**Question 6**

Correct

Mark 1.00 out of 1.00

SJF selects the task:

- a. which was first placed in the queue
- b. with the least CPU requirement ✓
- c. which was last placed in the queue
- d. who waited the longest in the queue

The correct answer is: with the least CPU requirement

**Question 7**

Partially correct

Mark 0.67 out of 1.00

What is true for simultaneous execution in the same context?

- a. The use of threads ensures concurrency within the process.
- b. A multiprocessor kernel can be concurrent ✓
- c. Threads minimize context switch time. ✓
- d. The shared context forces threads to run on the same processor

The correct answers are: Threads minimize context switch time., The use of threads ensures concurrency within the process., A multiprocessor kernel can be concurrent

**Question 8**

Correct

Mark 1.00 out of 1.00

The file system layer plays the following role in the operating system:

Select one or more:

- a. Controls file access rights ✓
- b. Performs file opening and closing operations ✓
- c. It performs directory services in the hierarchy of disk files ✓
- d. It runs programs stored in files

Twoja odpowiedź jest poprawna.

The correct answers are: Performs file opening and closing operations, It performs directory services in the hierarchy of disk files, Controls file access rights

**Question 9**

Correct

Mark 1.00 out of 1.00

Processor access scheduling decisions may be made under which of the following circumstances?

Select one or more:

- a. When a task transitions from the active state to the ready state ✓
- b. When a task terminates ✓
- c. When a task goes from the waiting state to the ready state ✓
- d. When a task goes from the active state to the waiting state ✓

Twoja odpowiedź jest poprawna.

The correct answers are: When a task goes from the active state to the waiting state, When a task transitions from the active state to the ready state, When a task goes from the waiting state to the ready state, When a task terminates

**Question 10**

Correct

Mark 1.00 out of 1.00

In which swapping algorithms is it necessary to collectively clear the M-bits?

Select one or more:

- a. no algorithm ✓
- b. working set clock
- c. NRU
- d. working set
- e. LFU
- f. FIFO
- g. clock
- h. LRU
- i. second chance

Twoja odpowiedź jest poprawna.

The correct answer is:

no algorithm

**Question 11**

Correct

Mark 1.00 out of 1.00

Static relocation is performed by:

- a. Special registers (DATUM)
- b. Loader ✓
- c. Paging system
- d. Segment descriptors

The correct answer is: Loader

**Question 12**

Correct

Mark 1.00 out of 1.00

What mechanism is part of time-sharing systems?

- a. short-term scheduler ✓
- b. long-term scheduler
- c. swapping
- d. medium-term scheduler

The correct answer is: short-term scheduler

**Question 13**

Correct

Mark 1.00 out of 1.00

Context switch is:

Select one or more:

- a. switching to the system stack
- b. calling the kernel of the operating system
- c. writing registers to the task stack and retrieving them from another task stack ✓
- d. extracode execution

Twoja odpowiedź jest poprawna.

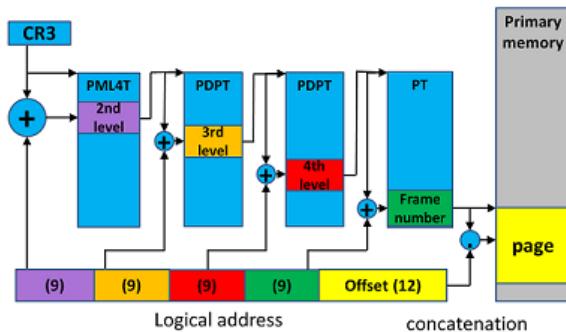
The correct answer is: writing registers to the task stack and retrieving them from another task stack

**Question 14**

Correct

Mark 1.00 out of 1.00

In the four-level page index table, the frame number is:



Select one or more:

- a. in the first level table - the leftmost in the figure
- b. part in the table of each level
- c. in the table of the last level - the rightmost in the figure ✓
- d. none of the above answers

Twoja odpowiedź jest poprawna.

The correct answer is: in the table of the last level - the rightmost in the figure

**Question 15**

Correct

Mark 1.00 out of 1.00

Virtual memory consists of:

Select one or more:

- a. primary memory and storage memory ✓
- b. primary memory and cloud storage
- c. main memory and cache
- d. cache and storage memory

Twoja odpowiedź jest poprawna.

The correct answer is: primary memory and storage memory

**Question 16**

Incorrect

Mark 0.00 out of 1.00

What type of code can execute on multiple datasets in parallel:

Select one or more:

- a. binary
- b. dynamically relocated ✗
- c. reentrant

Twoja odpowiedź jest niepoprawna.

The correct answer is: reentrant

**Question 17**

Correct

Mark 1.00 out of 1.00

What mechanism is used to desynchronize processes with different relative speeds?

Select one or more:

- a. scheduling
- b. preempting
- c. buffer ✓
- d. interrupts

Twoja odpowiedź jest poprawna.

The correct answer is: buffer

**Question 18**

Incorrect

Mark 0.00 out of 1.00

Address translation mechanism:

Select one or more:

- a. Concatenates the frame number and offset on the page
- b. Concatenates the frame number and page number
- c. Concatenates the page number and page offset ✗
- d. Adds the frame number to the page number

Twoja odpowiedź jest niepoprawna.

The correct answer is: Concatenates the frame number and offset on the page

**Question 19**

Correct

Mark 1.00 out of 1.00

When starting a program, how is control passed to it from the operating system?

Select one or more:

- a. jump
- b. extracode
- c. return from interrupt handler IRET ✓
- d. jump with trace

Twoja odpowiedź jest poprawna.

The correct answer is: return from interrupt handler IRET

**Question 20**

Correct

Mark 1.00 out of 1.00

The sweeping criteria include:

Select one or more:

- a. Analysis of program execution history ✓
- b. Program state ✓
- c. Segment referencing frequency
- d. Priority ✓

Twoja odpowiedź jest poprawna.

The correct answers are: Priority, Program state, Analysis of program execution history

**Question 21**

Correct

Mark 1.00 out of 1.00

Is memory protection useless on a single-user system?

- True
- False ✓

The correct answer is 'False'.

**Question 22**

Correct

Mark 1.00 out of 1.00

Paging - the key in associative memory is:

Select one or more:

- a. frame number
- b. page number ✓
- c. the frame number concatenated with the page number
- d. the page number concatenated with the frame number

Twoja odpowiedź jest poprawna.

The correct answer is: page number

**Question 23**

Correct

Mark 1.00 out of 1.00

What is a scheduler?

Select one or more:

- a. a kernel routine that selects a task to execute ✓
- b. the system process that allocates the processor
- c. procedure that schedules frame release in the page replace algorithm
- d. memory allocation procedure

Twoja odpowiedź jest poprawna.

The correct answer is: a kernel routine that selects a task to execute

**Question 24**

Correct

Mark 1.00 out of 1.00

Using Test-And-Set or Compare-And-Swap in synchronization:

Select one or more:

- a. Stops the processor if 0 is read
- b. It can only be applied in systems with shared memory ✓
- c. Requires organizing inactive waiting in queues
- d. It requires processes to actively wait ✓

Twoja odpowiedź jest poprawna.

The correct answers are: It requires processes to actively wait,  
It can only be applied in systems with shared memory

**Question 25**

Incorrect

Mark 0.00 out of 1.00

System/user threads:

Select one or more:

- a. User-level thread descriptors are stored in the operating system kernel. ❌
- b. User-level threads share the same stack.
- c. User-level threads share the same execution context. ✓

Twoja odpowiedź jest niepoprawna.

The correct answer is: User-level threads share the same execution context.

**Question 26**

Partially correct

Mark 0.75 out of 1.00

The environment in which the process is executed includes:

Select one or more:

- a. Open files
- b. Contents of the interrupt request register
- c. General purpose registers content ✓
- d. Process address space ✓
- e. A set of environment variables ✓
- f. The content in the memory management unit

Twoja odpowiedź jest częściowo poprawna.

You have correctly selected 3.

The correct answers are: A set of environment variables, Process address space, General purpose registers content, Open files

**Question 27**

Correct

Mark 1.00 out of 1.00

The sequence of actions in interrupt handling:

1. saving a copy of the interrupt vector (PC and SR) ✓
2. switching to system mode (modification of PC and status register) ✓
3. programmatic context saving ✓
4. switching to the system stack ✓

Twoja odpowiedź jest poprawna.

The correct answer is:

The sequence of actions in interrupt handling:

- 1.[saving a copy of the interrupt vector (PC and SR)]
- 2.[switching to system mode (modification of PC and status register)]
- 3.[programmatic context saving]
- 4.[switching to the system stack]

**Question 28**

Partially correct

Mark 0.50 out of 1.00

What does the file system layer do?

- a. Manages remote files
- b. Tracks the status of information
- c. Manages remote file systems
- d. Manages files ✓

The correct answers are: Tracks the status of information, Manages files

**Question 29**

Incorrect

Mark 0.00 out of 1.00

When is the scheduler called?

Select one or more:

- a. at the request of a user task
- b. when the scheduler decides itself
- c. at the start of execution of each kernel procedure ✗
- d. at the end of the execution of each kernel procedure

Twoja odpowiedź jest niepoprawna.

The correct answer is: at the end of the execution of each kernel procedure

**Question 30**

Correct

Mark 1.00 out of 1.00

Twins algorithm:

Select one or more:

- a. Causes external fragmentation ✓
- b. Causes less fragmentation than static division into equal blocks ✓
- c. Causes internal fragmentation ✓

Twoja odpowiedź jest poprawna.

The correct answers are: Causes internal fragmentation, Causes external fragmentation, Causes less fragmentation than static division into equal blocks

**Question 31**

Correct

Mark 1.00 out of 1.00

On UNIX, the number of files is directly limited by:

Select one or more:

- a. The size of the space allocated for files ✓
- b. Allocation unit size
- c. The number of bits of the field describing the size of the file
- d. The number of bits of the disk address
- e. FAT size

Twoja odpowiedź jest poprawna.

The correct answer is: The size of the space allocated for files

**Question 32**

Correct

Mark 1.00 out of 1.00

Between fork and exec operations, the following operations are performed:

Select one or more:

- a. Opening the appropriate input/output files ✓
- b. Allocating the appropriate amount of memory for the program being started
- c. Loading the program to be started into memory

Twoja odpowiedź jest poprawna.

The correct answer is: Opening the appropriate input/output files

**Question 33**

Correct

Mark 1.00 out of 1.00

Devices report their readiness by:

Select one or more:

- a. system call
- b. setting a status bit ✓
- c. issuing an interrupt ✓
- d. unblocking the interrupts

Twoja odpowiedź jest poprawna.

The correct answers are: issuing an interrupt, setting a status bit

**Question 34**

Correct

Mark 1.00 out of 1.00

The page fault exception is specific in that:

Select one or more:

- a. execution of the instruction may require decrementing the program counter ✓
- b. is reported in the "middle" of an instruction execution ✓
- c. continuation of the instruction execution may require the saving of internal processor registers storing intermediate values ✓
- d. there is no return to the program from it

Twoja odpowiedź jest poprawna.

The correct answers are: is reported in the "middle" of an instruction execution, execution of the instruction may require decrementing the program counter, continuation of the instruction execution may require the saving of internal processor registers storing intermediate values

**Question 35**

Correct

Mark 1.00 out of 1.00

Two successive executions of operation V in one process on a binary semaphore in down state:

Select one or more:

- a. If the semaphore guards a critical region, it can let two processes enter the critical region ✓
- b. Raises the semaphore if there are no suspended processes ✓
- c. Increases semaphore value by 2
- d. It doesn't change anything

Twoja odpowiedź jest poprawna.

The correct answers are: If the semaphore guards a critical region, it can let two processes enter the critical region, Raises the semaphore if there are no suspended processes

**Question 36**

Correct

Mark 1.00 out of 1.00

Multiprogram systems:

- a. They are only used on large mainframe computers
- b. It does any job faster
- c. It holds more than one program in primary memory at the same time ✓
- d. They are easier to develop than single-program systems

The correct answer is: It holds more than one program in primary memory at the same time

**Question 37**

Incorrect

Mark 0.00 out of 1.00

Multiprogramming is a technique in which, as a rule:

Select one or more:

- a. only addresses that can be generated by the processor when performing calculations are used
- b. is a memory allocation method by which a program is divided into equal parts
- c. is a method of allocating processor time ✗
- d. many programs can be stored in primary memory ✓

Twoja odpowiedź jest niepoprawna.

The correct answer is: many programs can be stored in primary memory

**Question 38**

Correct

Mark 1.00 out of 1.00

The effective address is also:

Select one or more:

- a. Physical address
- b. Absolute address
- c. Indirect address
- d. Logical address ✓

Twoja odpowiedź jest poprawna.

The correct answer is: Logical address

**Question 39**

Correct

Mark 1.00 out of 1.00

Page thrashing is a phenomenon involving:

Select one or more:

- a. frequent downloading of pages that have just been swapped out from memory ✓
- b. frequent context changes that require page index tables to be reloaded
- c. frequently changing the values of bits describing pages in frames
- d. loading the same page over and over again

Twoja odpowiedź jest poprawna.

The correct answer is: frequent downloading of pages that have just been swapped out from memory

**Question 40**

Correct

Mark 1.00 out of 1.00

What mechanism is part of batch systems?

- a. high-level scheduler ✓
- b. low-level scheduler
- c. no scheduler is needed
- d. medium-level scheduler ✓

The correct answers are: high-level scheduler, medium-level scheduler

**Question 41**

Correct

Mark 1.00 out of 1.00

The sweeping mechanism consists in:

Select one or more:

- a. Loading segments into primary memory and sending them to disk ✓
- b. Loading pages into the primary memory and sending them to the disk
- c. Merging adjacent free memory blocks
- d. Moving programs around in memory to eliminate fragmentation

Twoja odpowiedź jest poprawna.

The correct answer is: Loading segments into primary memory and sending them to disk

**Question 42**

Correct

Mark 1.00 out of 1.00

A memory management technique in which the system divides memory into equal-sized chunks with virtual base addresses divisible by a chunk size, to easily manage relocation, is called:

Select one or more:

- a. swapping
- b. mapping
- c. fragmentation
- d. paging ✓

Twoja odpowiedź jest poprawna.

The correct answer is: paging

**Question 43**

Correct

Mark 1.00 out of 1.00

In indulgent scheduling, the process keeps the CPU until:

Select one or more:

- a. next interrupt from the timer
- b. next interrupt from the device
- c. waiving ✓
- d. termination ✓



Twoja odpowiedź jest poprawna.

The correct answers are: waiving, termination

**Question 44**

Correct

Mark 1.00 out of 1.00

Allocation unit for file storage:

- a. must be constant across the disk partition ✓
- b. may vary between partitions ✓
- c. may differ between files in a partition
- d. is any integer multiple of a sector (>0)

The correct answers are: must be constant across the disk partition, may vary between partitions

**Question 45**

Incorrect

Mark 0.00 out of 1.00

Allocation unit for file storage:

- a. may be a variable in a partition
- b. may differ between files on a partition ✗
- c. It should be selected to match the characteristics of the data
- d. must be constant across the disk partition ✓

The correct answer is: must be constant across the disk partition

**Question 46**

Correct

Mark 1.00 out of 1.00

When an exception is raised in user mode, the operating system switches to the kernel system stack, and what happens when an exception is raised in system mode?

Select one or more:

- a. nothing special, it builds the context on the kernel system stack ✓
- b. initializes the kernel system stack from the scratch
- c. switches to the next kernel system stack
- d. switches back to the application program stack

Twoja odpowiedź jest poprawna.

The correct answer is: nothing special, it builds the context on the kernel system stack

**Question 47**

Correct

Mark 1.00 out of 1.00

Conditional variables in a monitor

Select one or more:

- a. They are used to suspend processes that cannot run because the conditions for their continuation are not met ✓
- b. They guard access to the critical region of the monitor
- c. They are used to check whether the conditions for process continuation are met

Twoja odpowiedź jest poprawna.

The correct answer is: They are used to suspend processes that cannot run because the conditions for their continuation are not met

**Question 48**

Correct

Mark 1.00 out of 1.00

By definition, a deadlock is a situation where:

Select one or more:

- a. any greater than zero number of processes are waiting for conditions that cannot be met ✓
- b. any greater than one number of processes are waiting for conditions that cannot be met
- c. at least two processes are waiting for conditions that cannot be met
- d. exactly one process is waiting for a condition that cannot be met

Twoja odpowiedź jest poprawna.

The correct answer is: any greater than zero number of processes are waiting for conditions that cannot be met

**Question 49**

Incorrect

Mark 0.00 out of 1.00

How is exception identification performed?

Select one or more:

- a. all exceptions are specified using the data bus
- b. the specification of hardware interrupts is given over the data bus
- c. the specification of hardware interrupts and traps is given over the data bus ✗
- d. the specification of hardware interrupts and errors is given over the data bus

Twoja odpowiedź jest niepoprawna.

The correct answer is: the specification of hardware interrupts is given over the data bus

**Question 50**

Correct

Mark 1.00 out of 1.00

In a multiprocessor operating system, interrupt blocking is sufficient to prevent the microkernel from executing its routines simultaneously

 True False ✓

nie

The correct answer is 'False'.

**Question 51**

Correct

Mark 1.00 out of 1.00

After performing the mount(/dev/hd5,/usr/x/bin/hd5) operation, the file /usr/z/a on the mounted disk should be referenced by:

Select one or more:

- a. /dev/hd5/usr/z/a
- b. /usr/x/bin/hd5/usr/z/a ✓
- c. /usr/x/bin/dev/hd5/usr/z/a

Twoja odpowiedź jest poprawna.

The correct answer is: /usr/x/bin/hd5/usr/z/a

**Question 52**

Correct

Mark 1.00 out of 1.00

The scheduling goal, which is to occupy processors as efficiently as possible, is:

Select one or more:

- a. response time
- b. productivity
- c. utilization ✓

Twoja odpowiedź jest poprawna.

The correct answer is: utilization

**Question 53**

Correct

Mark 1.00 out of 1.00

When a suspended program is moved to auxiliary memory, its process state is called:

- a. moved out
- b. rinsed out
- c. swept away ✓
- d. exchanged

The correct answer is: swept away

**Question 54**

Correct

Mark 1.00 out of 1.00

Address translation aims to:

Select one or more:

- a. detecting the phenomenon of locality of references
- b. converting a virtual address to a physical one ✓
- c. Generating a "frame error" interrupt when the page is out of memory
- d. converting a physical address to a virtual one

Twoja odpowiedź jest poprawna.

The correct answer is: converting a virtual address to a physical one

**Question 55**

Partially correct

Mark 0.67 out of 1.00

The hardware resources of a computer system are:

Select one or more:

- a. Primary memory ✓
- b. Peripheral devices ✓
- c. Windows on the screen
- d. Processor time

Twoja odpowiedź jest częściowo poprawna.

You have correctly selected 2.

The correct answers are: Processor time, Primary memory, Peripheral devices

**Question 56**

Incorrect

Mark 0.00 out of 1.00

The return from interrupt instruction:

Select one or more:

- a. always jumps to the process that was interrupted
- b. restores the interrupt vector
- c. restores general purpose registers ✗
- d. restores the stack pointer ✗

Twoja odpowiedź jest niepoprawna.

The correct answer is: restores the interrupt vector

**Question 57**

Correct

Mark 1.00 out of 1.00

Dynamic relocation is performed by:

- a. Loader
- b. Linker
- c. Compiler
- d. Special registers (DATUM) ✓

The correct answer is: Special registers (DATUM)

**Question 58**

Incorrect

Mark 0.00 out of 1.00

Cloning a process with a *fork* operation results in (not taking to account the numerical result of *fork*):

Select one or more:

- a. Duplication of code segment, initialization of new data segment and stack segment
- b. Duplication of data segment and stack segment
- c. Duplication of code, data and stack segments ✗

Twoja odpowiedź jest niepoprawna.

The correct answer is: Duplication of data segment and stack segment

**Question 59**

Incorrect

Mark 0.00 out of 1.00

Paging - two-level index tables mode of operation

Select one or more:

- a. The content of a level 1 table element points to a level 2 table ✖
- b. The content of the level 1 table element is concatenated (combined) with the content of the level 2 table element
- c. The content of a level 1 table element points to a level 2 table
- d. The content of a level 1 table element is an index in a level 2 table ✖

Twoja odpowiedź jest niepoprawna.

The correct answer is: The content of a level 1 table element points to a level 2 table

**Question 60**

Correct

Mark 1.00 out of 1.00

Address translation is handled by a unit called (give the abbreviation):

Answer: MMU



The correct answer is: MMU

**Question 61**

Incorrect

Mark 0.00 out of 5.00

What is the average time in the system for tasks in the batch, using SJF algorithm?

task	1	2	3	4
processing time	3.4	5.3	2.3	1.1

Answer: 4.3



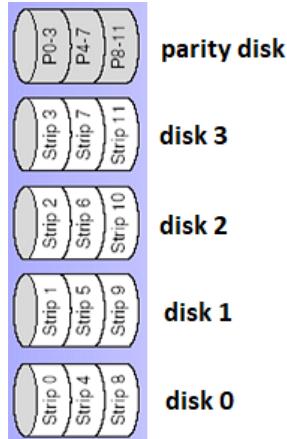
The correct answer is: 5.8

**Question 62**

Correct

Mark 5.00 out of 5.00

In RAID 4, data is placed in Strips that are "scattered" over the data disks, so that each subsequent strip is on the next data disk, modulo the number of disks. For this, there is a parity disk that holds the parity bits of zeroth bits, first bits, second bits, etc., equal-numbered strips divided by the number of data disks, for example, strips 0-3, 4-7, 8-11, etc.:



the start of strips 0,1,2,3 looks like this:

1	1	1	0	0	Parity disk
0	0	0	0	0	Disk 3
1	0	0	1	0	Disk 2
1	0	1	0	1	Disk 1
0	1	1	0	0	Disk 0

In the parity strip, the values are placed so that the parity bit keeps the corresponding strip bits 0-3 even.

Disk 3 has been damaged and reads only 0. After replacing the disk with a new one, what values should be put in the strip on disk 3?

Answer:  ✓

The correct answer is: 10111

**Question 63**

Incorrect

Mark 0.00 out of 5.00

The virtual address consists of 7b page number and 9b offset. The page index table is shown below (index, content). For decimal address 2690, binary 0000 1010 1000 0010, specify the physical address in the form: frame number.offset (as decimal numbers, offset in 3 digits). For example, for a physical address consisting of frame 0 and offset 18, specify 0.018. If there is no physical address for the given virtual address, then -1 should be specified.

7	12
6	0
5	-1
4	4
3	9
2	5
1	-1
0	2

Answer: 2.130 ✖

The correct answer is: -1.000

<b>Started on</b>	Tuesday, 14 May 2024, 3:15 PM
<b>State</b>	Finished
<b>Completed on</b>	Tuesday, 14 May 2024, 4:00 PM
<b>Time taken</b>	44 mins 52 secs
<b>Marks</b>	12.25/60.00
<b>Grade</b>	4.08 out of 20.00 (20.42%)

**Question 1**

Correct

Mark 1.00 out of 1.00

Semaphores are used to solve the problem:

- a. process scheduling
- b. races
- c. mutual exclusion ✓
- d. Belady problem

The correct answer is: mutual exclusion

**Question 2**

Incorrect

Mark 0.00 out of 1.00

When the processor is released, the scheduler selects one of the queued processes:

Select one or more:

- a. suspended
- b. waiting
- c. ready ✓
- d. running ✗

Twoja odpowiedź jest niepoprawna.

The correct answer is: ready

**Question 3**

Incorrect

Mark 0.00 out of 1.00

There are three processes in the system:

- C - calculation process (batch process performing complex calculations lasting several hours),
- T - text editor (user edits text document)
- K - compiler (the user compiles the program, e.g. in C++).

Assign processes to priorities in the operating system from the highest to the lowest priority.

highest	C	
intermediate	T	
lowest	K	

Twoja odpowiedź jest niepoprawna.

The correct answer is:

There are three processes in the system:

- C - calculation process (batch process performing complex calculations lasting several hours),
- T - text editor (user edits text document)
- K - compiler (the user compiles the program, e.g. in C++).

Assign processes to priorities in the operating system from the highest to the lowest priority.

highest [T]

intermediate [K]

lowest [C]

**Question 4**

Correct

Mark 1.00 out of 1.00

Semaphore function is to:

- a. synchronize processes for better CPU utilization
- b. synchronize critical resources to prevent deadlock ✓
- c. memory management
- d. process scheduling

The correct answer is: synchronize critical resources to prevent deadlock

**Question 5**

Correct

Mark 1.00 out of 1.00

At the blocked state is a process that:

Select one or more:

- a. occupies a processor
- b. waits for a processor
- c. waits for an I/O operation to complete ✓
- d. fills the processor idle time

Twoja odpowiedź jest poprawna.

The correct answer is: waits for an I/O operation to complete

**Question 6**

Correct

Mark 1.00 out of 1.00

In the running state, there is a process that:

Select one or more:

- a. waits for an I/O operation to complete
- b. fills the CPU idle time
- c. waits for a processor
- d. occupies a processor ✓

Twoja odpowiedź jest poprawna.

The correct answer is: occupies a processor

**Question 7**

Incorrect

Mark 0.00 out of 1.00

What are the functions of the kernel?

- a. Program management ✗
- b. Memory management ✗
- c. Interrupt handling ✓
- d. File management ✗

The correct answer is: Interrupt handling

**Question 8**

Incorrect

Mark 0.00 out of 1.00

The system stack must provide space for:

Select one or more:

- a. Processor registers in as many copies as there are interrupt lines and possible software interrupts ✗
- b. Processor registers in as many copies as there are interrupt lines +1 ✓
- c. Processor registers in as many copies as there are devices in the system +1
- d. CPU registers

Twoja odpowiedź jest niepoprawna.

The correct answer is: Processor registers in as many copies as there are interrupt lines +1

**Question 9**

Partially correct

Mark 0.33 out of 1.00

Interrupt vector is saved in a case of:

Select one or more:

- a. subroutine call
- b. accepting a non-maskable interrupt
- c. accepting a hardware interrupt ✓
- d. jump with trace

Twoja odpowiedź jest częściowo poprawna.

You have correctly selected 1.

The correct answers are: accepting a hardware interrupt, accepting a non-maskable interrupt, jump with trace

**Question 10**

Incorrect

Mark 0.00 out of 1.00

The environment in which the process is executed includes:

Select one or more:

- a. Open files ✓
- b. Contents of the interrupt request register
- c. General purpose registers content ✓
- d. The content in the memory management unit ✗

Twoja odpowiedź jest niepoprawna.

The correct answers are: General purpose registers content, Open files

**Question 11**

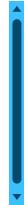
Partially correct

Mark 0.50 out of 1.00

The return from interrupt instruction:

Select one or more:

- a. restores the program counter ✓
- b. restores the conditions register
- c. restores the process stack
- d. causes the processor to switch to a process other than the interrupted one



Twoja odpowiedź jest częściowo poprawna.

You have correctly selected 1.

The correct answers are: restores the program counter, restores the conditions register

**Question 12**

Partially correct

Mark 0.50 out of 1.00

What mechanism is part of batch systems?

- a. low-level scheduler
- b. no scheduler is needed
- c. medium-tevel scheduler
- d. high-level scheduler ✓

The correct answers are: high-level scheduler, medium-tevel scheduler

**Question 13**

Incorrect

Mark 0.00 out of 1.00

Operation V on a raised binary semaphore:

Select one or more:

- a. It is stored in order to be able to perform as many operations P as there were V
- b. Increases semaphore value by 1 ✗
- c. It does not change the value of the semaphore

Twoja odpowiedź jest niepoprawna.

The correct answer is: It does not change the value of the semaphore

**Question 14**

Incorrect

Mark 0.00 out of 1.00

The scheduler decisions take the form:

Select one or more:

- a. change from waiting to active state
- b. change from active to ready state
- c. change from ready to active state ✓
- d. change from waiting to ready state ✗

Twoja odpowiedź jest niepoprawna.

The correct answer is: change from ready to active state

**Question 15**

Incorrect

Mark 0.00 out of 1.00

The multi-level interrupt controller includes:

Select one or more:

- a. Priority encoder ✓
- b. Individual interrupt mask ✓
- c. The register of interrupt being serviced ✗
- d. Collective interrupt mask

Twoja odpowiedź jest niepoprawna.

The correct answers are: Collective interrupt mask, Individual interrupt mask, Priority encoder

**Question 16**

Partially correct

Mark 0.50 out of 1.00

Scheduling aims to optimize:

Select one or more:

- a. reaction time
- b. wait time ✓
- c. processor utilization
- d. system throughput ✓

Twoja odpowiedź jest częściowo poprawna.

You have correctly selected 2.

The correct answers are: processor utilization, system throughput, wait time, reaction time

**Question 17**

Incorrect

Mark 0.00 out of 1.00

Which mechanism is a part of Time-sharing systems?

Select one or more:

- a. no scheduler is needed
- b. Long-Term Scheduler ✗
- c. Medium-Term Scheduler
- d. Short-Term Scheduler ✓



Twoja odpowiedź jest niepoprawna.

The correct answer is:

Short-Term Scheduler

**Question 18**

Correct

Mark 1.00 out of 1.00

When an exception is raised in user mode, the operating system switches to the kernel system stack, and what happens when an exception is raised in system mode?

Select one or more:

- a. initializes the kernel system stack from the scratch
- b. switches back to the application program stack
- c. switches to the next kernel system stack
- d. nothing special, it builds the context on the kernel system stack ✓

Twoja odpowiedź jest poprawna.

The correct answer is: nothing special, it builds the context on the kernel system stack

**Question 19**

Incorrect

Mark 0.00 out of 1.00

The interrupt acceptance sequence consists of (in the sequence):

Select one or more:

- a. identification of the interrupt level, performing a jump with the trace according to the interrupt table, saving the interrupt vector
- b. identification of the interrupt level, performing a jump according to the interrupt table, saving the interrupt vector
- c. identification of the interrupt level, saving the interrupt vector, performing a jump with a trace according to the interrupt table
- d. identification of the interrupt level, saving the interrupt vector, performing a jump according to the interrupt table ✗

Twoja odpowiedź jest niepoprawna.

The correct answer is: identification of the interrupt level, saving the interrupt vector, performing a jump with a trace according to the interrupt table

**Question 20**

Correct

Mark 1.00 out of 1.00

Round-robin scheduling is the best mechanism for:

Select one or more:

- a. every system
- b. system with different classes of tasks
- c. time-sharing system ✓
- d. real-time system

Twoja odpowiedź jest poprawna.

The correct answer is: time-sharing system

**Question 21**

Incorrect

Mark 0.00 out of 1.00

Which scheduler is also called a job planner?

- a. long-term
- b. medium-term
- c. short-term ✗
- d. auxiliary

The correct answer is: long-term

**Question 22**

Incorrect

Mark 0.00 out of 1.00

Which of the following statements applies to the process?

- a. A process is a running program.
- b. A process is defined as a set of resources needed to run a program. ✓
- c. A process is code and data loaded into main memory. ✗
- d. The execution of the process must proceed in a sequential manner.

The correct answers are: A process is a running program., The execution of the process must proceed in a sequential manner., A process is defined as a set of resources needed to run a program.

**Question 23**

Incorrect

Mark 0.00 out of 1.00

Which scheduling is used to organize concurrency?

Select one or more:

- a. preempting ✕
- b. short-term
- c. long-term
- d. medium-term

Twoja odpowiedź jest niepoprawna.

The correct answer is: short-term

**Question 24**

Incorrect

Mark 0.00 out of 1.00

What can happen when a job leaves the critical section and more than 1 task is waiting for the critical section?

Select one or more:

- a. letting both tasks into the critical section ✕
- b. active waiting for a critical section ✕
- c. deadlock waiting for critical section
- d. starvation awaiting a critical section ✓

Twoja odpowiedź jest niepoprawna.

The correct answer is: starvation awaiting a critical section

**Question 25**

Correct

Mark 1.00 out of 1.00

Context switch is:

Select one or more:

- a. calling the kernel of the operating system
- b. switching to the system stack
- c. writing registers to the task stack and retrieving them from another task stack ✓
- d. extracode execution

Twoja odpowiedź jest poprawna.

The correct answer is: writing registers to the task stack and retrieving them from another task stack

**Question 26**

Incorrect

Mark 0.00 out of 1.00

Using the Test-And-Set instruction in synchronization:

Select one or more:

- a. Stops the processor if 0 is read
- b. Requires organizing inactive waiting in queues
- c. Requires the use of semaphores ✗
- d. It requires processes to actively wait

Twoja odpowiedź jest niepoprawna.

The correct answer is: It requires processes to actively wait

**Question 27**

Partially correct

Mark 0.75 out of 1.00

How does the operating system call the task completion subroutine?

- 4. recreates the context programmatically and executes the IRET instruction ✓
- 2. sets the trace in the terminating subroutine to the current position ✓
- 3. recreates the context programmatically and executes the IRET instruction ✗
- 1. builds the frame of the terminating subroutine on the task stack ✓

Twoja odpowiedź jest częściowo poprawna.

You have correctly selected 3.

The correct answer is: 4. → recreates the context programmatically and executes the IRET instruction, 2. → sets the trace in the terminating subroutine to the current position, 3. → builds an interrupt vector on the system stack pointing to the terminating subroutine code, 1. → builds the frame of the terminating subroutine on the task stack

**Question 28**

Correct

Mark 1.00 out of 1.00

Interrupt request register is:

Select one or more:

- a. a register that blocks or unblocks all interrupts
- b. a register where interrupt line states are stored ✓
- c. a register that blocks or unblocks individual interrupts
- d. a combinational circuit that calculates the number of the interrupt received

Twoja odpowiedź jest poprawna.

The correct answer is: a register where interrupt line states are stored

**Question 29**

Correct

Mark 1.00 out of 1.00

What mechanism is part of time-sharing systems?

- a. medium-term scheduler
- b. swapping
- c. short-term scheduler ✓
- d. long-term scheduler

The correct answer is: short-term scheduler

**Question 30**

Partially correct

Mark 0.67 out of 1.00

The environment in which the process is executed includes:

Select one or more:

- a. General purpose registers content
- b. Process address space ✓
- c. Contents of the interrupt request register
- d. A set of environment variables ✓

Twoja odpowiedź jest częściowo poprawna.

You have correctly selected 2.

The correct answers are: A set of environment variables, Process address space, General purpose registers content

**Question 31**

Incorrect

Mark 0.00 out of 5.00

What is the average time in the system for tasks in the batch, using SJF algorithm?

The system is equipped with 4 processors

task	1	2	3	4
processing time	3.6	4.6	2.4	1.2

Answer: 4.35 

The correct answer is: 2.9

**Question 32**

Complete

Mark 0.00 out of 25.00

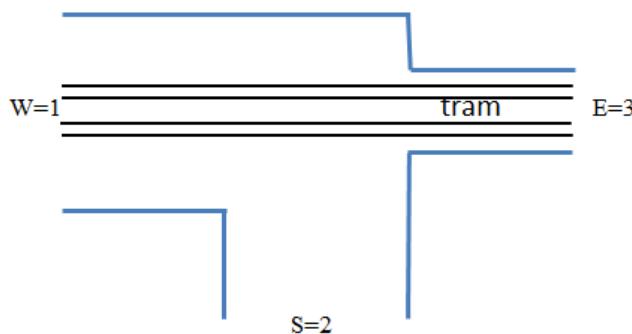
Design a priority semaphore and use it to control traffic at the intersection.

Trams have priority over cars.

Note: tram tracks close to the edge mean that a car cannot fit parallel to a tram, far from the edge means a car can fit.

WSE - direction numbering.

Topography of the intersection:



```
class IntersectionSemaphore:
    def __init__(self):
        self.tram_priority = False # Flag indicating if trams have priority
        self.tram_queue = [] # Queue for trams waiting at the intersection
        self.car_queue = [] # Queue for cars waiting at the intersection

    def tram_arrival(self, direction):
        if not self.tram_priority and not self.car_queue:
            self.tram_priority = True
            self.tram_queue.append(direction)

    def car_arrival(self, direction):
        if self.tram_priority or self.tram_queue:
            self.car_queue.append(direction)

    def tram_departure(self):
        if self.tram_queue:
            self.tram_queue.pop(0)
        if not self.tram_queue:
            self.tram_priority = False

    def car_departure(self):
        if self.car_queue:
            self.car_queue.pop(0)
```

```
def print_intersection_status(self):  
    print("Tram Priority:", self.tram_priority)  
    print("Tram Queue:", self.tram_queue)  
    print("Car Queue:", self.car_queue)
```

```
# Example usage:  
intersection = IntersectionSemaphore()
```

```
# Tram arrives  
intersection.tram_arrival("WSE")
```

```
# Car arrives  
intersection.car_arrival("WSE")
```

```
# Tram departs  
intersection.tram_departure()
```

```
# Car departs  
intersection.car_departure()
```

```
# Print intersection status  
intersection.print_intersection_status()
```

Comment:

A vehicle should not reserve the entire crossing

<b>Started on</b>	Tuesday, 6 May 2025, 3:18 PM
<b>State</b>	Finished
<b>Completed on</b>	Tuesday, 6 May 2025, 3:56 PM
<b>Time taken</b>	38 mins 8 secs
<b>Marks</b>	31.83/50.00
<b>Grade</b>	7.96 out of 12.50 (63.67%)

**Question 1**

Correct

Mark 1.00 out of 1.00

The difference between trap and error is:

Select one or more:

- a. the error is issued by hardware and the trap by software
- b. there is no significant difference
- c. errors are generally reported asynchronously and traps synchronously ✓
- d. after an error, there is usually no return to the program, and after a trap, yes ✓

Twoja odpowiedź jest poprawna.

The correct answers are: after an error, there is usually no return to the program, and after a trap, yes, errors are generally reported asynchronously and traps synchronously

**Question 2**

Correct

Mark 1.00 out of 1.00

In the case of hardware interrupt summation ("wire or"):

Select one or more:

- a. the processor can programmatically poll devices about issuing an interrupt ✓
- b. the interrupt circuit can query devices about issuing an interrupt
- c. the bus driver can poll devices about issuing an interrupt ✓
- d. the interrupt source is identified by a special bus signal

Twoja odpowiedź jest poprawna.

The correct answers are: the processor can programmatically poll devices about issuing an interrupt, the bus driver can poll devices about issuing an interrupt

**Question 3**

Incorrect

Mark 0.00 out of 1.00

Precise interrupts are:

Select one or more:

- a. accepted only in a stable state between the execution of successive instructions ✓
- b. unblocked only in a stable state between the execution of successive instructions ✗
- c. only issued in a stable state between executions of subsequent instructions ✗
- d. transferred only in a stable state between the execution of successive instructions instrukcji ✗

Twoja odpowiedź jest niepoprawna.

The correct answer is: accepted only in a stable state between the execution of successive instructions

**Question 4**

Incorrect

Mark 0.00 out of 1.00

If the loader inserts a program with absolute addresses into a fixed address space, it is called:

- a. Dynamic relocation
- b. Static relocation ✗
- c. Dynamic loading
- d. Static loading

The correct answer is: Dynamic relocation

**Question 5**

Correct

Mark 1.00 out of 1.00

Dynamic relocation requires the use of:

Select one or more:

- a. base register (DATUM) ✓
- b. limit register
- c. status register
- d. program counter

Twoja odpowiedź jest poprawna.

The correct answer is: base register (DATUM)

**Question 6**

Correct

Mark 1.00 out of 1.00

If the compiler prepares a program with absolute addresses to be loaded in a fixed address space, it is called:

- a. Dynamic compiling
- b. Static relocation ✓
- c. Static compiling
- d. Dynamic relocation

The correct answer is: Static relocation

**Question 7**

Partially correct

Mark 0.50 out of 1.00

Dynamic relocation is performed by:

- a. Paging system
- b. Linker
- c. Special registers (DATUM) ✓
- d. Loader

The correct answers are: Special registers (DATUM), Paging system

**Question 8**

Correct

Mark 1.00 out of 1.00

The scheduling goal, which is to occupy processors as efficiently as possible, is:

Select one or more:

- a. response time
- b. utilization ✓
- c. productivity

Twoja odpowiedź jest poprawna.

The correct answer is: utilization

**Question 9**

Incorrect

Mark 0.00 out of 1.00

Which of the following memory allocation schemes can cause external fragmentation?

- a. Multiple contiguous fixed partitions of various sizes ✗
- b. Segmentation ✓
- c. Paging
- d. Multiple contiguous fixed partitions of equal size
- e. Sweeping ✓

The correct answers are: Segmentation, Sweeping

**Question 10**

Partially correct

Mark 0.33 out of 1.00

Onion algorithm:

Select one or more:

- a. Causes external fragmentation
- b. Reduces external fragmentation by aligning the allocation order with the process hierarchy ✓
- c. Causes internal fragmentation

Twoja odpowiedź jest częściowo poprawna.

You have correctly selected 1.

The correct answers are: Causes internal fragmentation, Causes external fragmentation, Reduces external fragmentation by aligning the allocation order with the process hierarchy

**Question 11**

Partially correct

Mark 0.50 out of 1.00

Which of the following memory allocation schemes cause external fragmentation?

- a. Sweeping
- b. Paging
- c. Segmentation ✓
- d. Multiple contiguous fixed partitions of equal size

The correct answers are: Segmentation, Sweeping

**Question 12**

Correct

Mark 1.00 out of 1.00

Context switch is:

Select one or more:

- a. switching to the system stack
- b. writing registers to the task stack and retrieving them from another task stack ✓
- c. extracode execution
- d. calling the kernel of the operating system

Twoja odpowiedź jest poprawna.

The correct answer is: writing registers to the task stack and retrieving them from another task stack

**Question 13**

Correct

Mark 1.00 out of 1.00

The system stack must provide space for:

Select one or more:

- a. CPU registers
- b. Processor registers in as many copies as there are interrupt lines and possible software interrupts
- c. Processor registers in as many copies as there are interrupt lines +1 ✓
- d. Processor registers in as many copies as there are devices in the system +1

Twoja odpowiedź jest poprawna.

The correct answer is: Processor registers in as many copies as there are interrupt lines +1

**Question 14**

Incorrect

Mark 0.00 out of 1.00

What is a scheduler?

Select one or more:

- a. procedure that schedules frame release in the page replace algorithm
- b. memory allocation procedure
- c. a kernel routine that selects a task to execute ✓
- d. the system process that allocates the processor ✗

Twoja odpowiedź jest niepoprawna.

The correct answer is: a kernel routine that selects a task to execute

**Question 15**

Correct

Mark 1.00 out of 1.00

Which of the following applies to user-level threads?

- a. The organization of user-level threads is specific to the operating system.
- b. User-level threads cost no execution time in system mode. ✓
- c. User-level threads require their descriptors in the kernel.
- d. User-level threads can themselves be multi-threaded.

The correct answer is: User-level threads cost no execution time in system mode.

**Question 16**

Correct

Mark 1.00 out of 1.00

The thread is also called:

- a. lightweight process ✓
- b. data process
- c. overlay process
- d. heavy process

The correct answer is: lightweight process

**Question 17**

Partially correct

Mark 0.50 out of 1.00

System/user threads:

Select one or more:

- a. User-level threads share the same stack.
- b. User-level threads share the same execution context.
- c. User-level thread descriptors are stored in the address space of the program. ✓

Twoja odpowiedź jest częściowo poprawna.

You have correctly selected 1.

The correct answers are: User-level thread descriptors are stored in the address space of the program., User-level threads share the same execution context.

**Question 18**

Incorrect

Mark 0.00 out of 1.00

What is the average time in the system for tasks in the batch incoming in this order, using FCFS algorithm?

The system is equipped with 3 processors

task	1	2	3	4
processing time	3.6	6	2.6	1.3

Answer: 3.7 ✘

The correct answer is: 4.0

**Question 19**

Correct

Mark 1.00 out of 1.00

We have the tasks with the following priorities in the access to a resource (a larger number is a higher priority):

Process number	1	2	3	4	5	6
Priority	37	38	29	30	32	25

The scheduling policy is preemptive, with the decision time constraint based on time slicing.

The current process is number 4. What process will get the resource in the nearest decision? Provide its priority.

Answer:

The correct answer is: 38

**Question 20**

Incorrect

Mark 0.00 out of 1.00

What is the average time in the system for tasks in the batch incoming in this order, using FCFS algorithm?

The system is equipped with 4 processors

task	1	2	3	4
processing time	3.2	6.2	2.7	1.6

Answer:

The correct answer is: 3.4

**Question 21**

Correct

Mark 5.00 out of 5.00

page	M	R	belongs to process
1	1	0	4
2	0	0	3
3	1	1	3
4	0	1	2
5	1	0	6
6	1	0	6
7	0	0	5
8	1	1	4

Using the above table of bits M and R for the pages in NRU swapping, with the priority frame allocation rule, which page will be sent to the disk first? The pages are scanned starting from the top. A process number is its priority (the smaller number, the higher priority). The process for which the frame is needed is 4. Provide a page number.

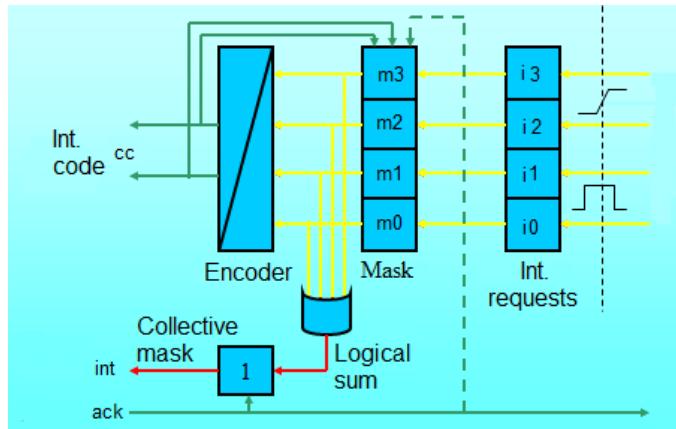
Answer:

The correct answer is: 7

**Question 22**

Incorrect

Mark 0.00 out of 5.00



In the given interrupt controller structure, the interrupt number **cc** reported to the processor is equal to 0. What will be the form of the interrupt mask (from **m3** to **m0**) after the processor confirms the reception of this interrupt?

The interrupt with index 3 has the highest priority.

Enter the mask in the form **.m3m2m1m0** (preceded by a point), for example **.0101**

If this is not possible, enter **-0001**.

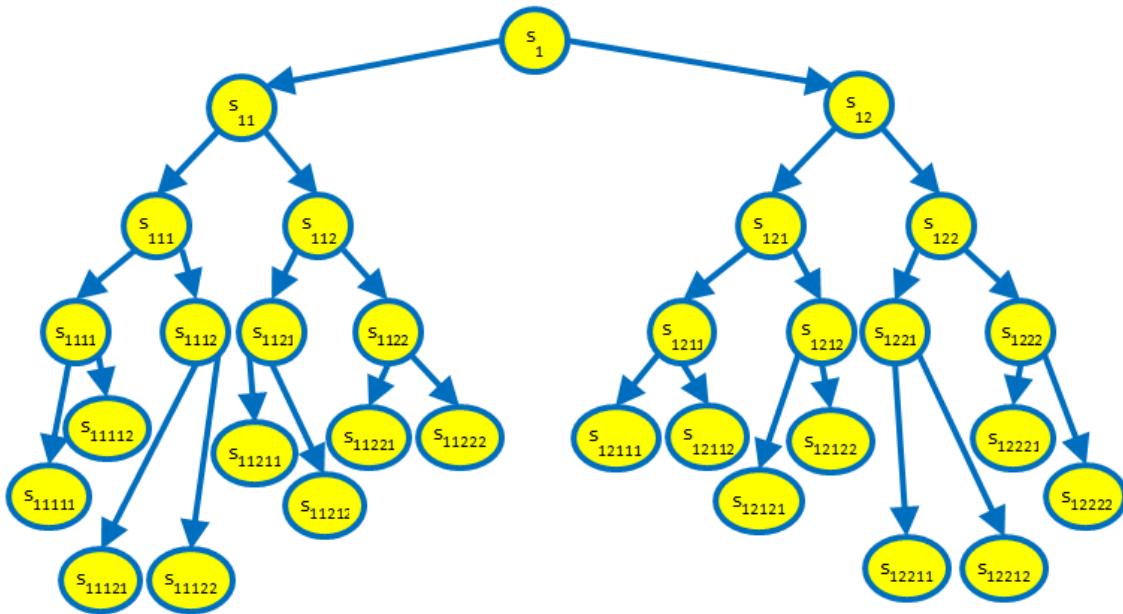
Answer:  ✖

The correct answer is: **0.1110**

**Question 23**

Correct

Mark 5.00 out of 5.00



Above is the nesting structure of subroutines in some program. Subroutine s12211 calls its "parent" in the hierarchy. To what stack frame (which subroutine) will the dynamic link be made in the called subroutine frame?

Enter the name of the subroutine with the index, without the letter "s", e.g. for s1112 enter 11122

Answer:  ✓

The correct answer is: 12211

**Question 24**

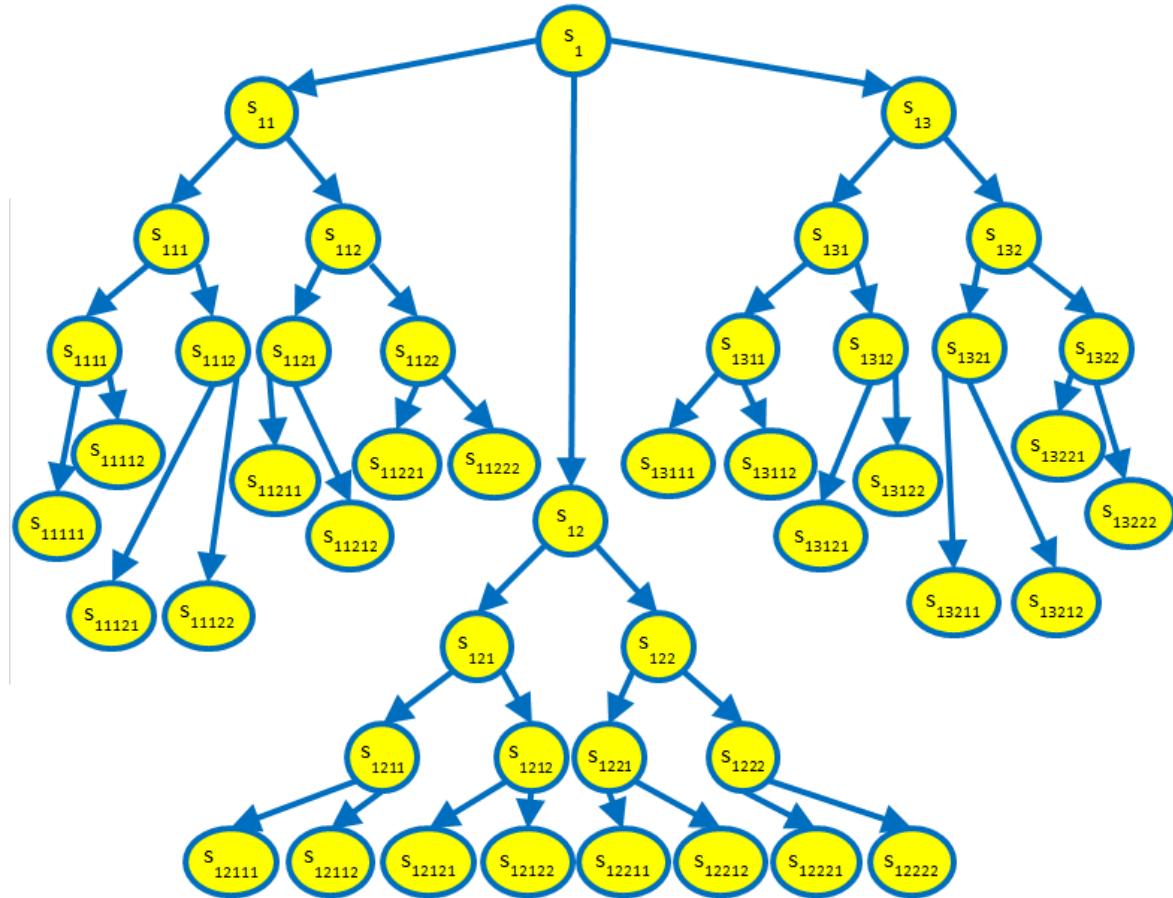
Incorrect

Mark 0.00 out of 5.00

Below is the nesting structure of subroutines in some program.

The stack frame of which subroutine (specify the index) will be pointed by the static link in the frame of the subroutine S1211, that is called from the subroutine S12112?

If the call is not possible, enter index -1.



Answer:  ×

The correct answer is: 121

**Question 25**

Correct

Mark 5.00 out of 5.00

What is the average time in the system for tasks in the batch, using SJF algorithm?

task	1	2	3	4
processing time	3.4	6.4	2.7	1.1

Answer: 6.4 ✓

The correct answer is: 6.4

**Question 26**

Correct

Mark 5.00 out of 5.00

The organization of memory and processor is word-based. A word means 16 bits (int also takes 1 16-bit word). Hexadecimal values are preceded by a # character.

variable a has the value #a0c0

top of the stack (full descending, i.e. the stack pointer points to the most recently put element on the stack, and the stack expands towards lower addresses) #c100

stack frame before subroutine B call #c1010

address of subroutine B #1021

Calling rules: Parameters are put on the stack in accordance with the convention of the C language, i.e. starting from the last one, without a static connection, the result of the function is passed in registers. The stack is shown after subroutine B is called by itself (recursively), at label point C. Subroutine B is called for the first time B(a-2); somewhere in the program from address #1011. Label C has address #1050.

regardless of the programming language, subroutine B has the form

B(int i);

{

    int p=i+1;

    C:     B(i-3);

}

The content of the cell at address #c0ff:  ✓

Address	content	
#c100	????	
#c0ff	#a0be	
#c0fe	#1012	
#c0fd	#c010	
#c0fc	#a0bf	
#c0fb	#a0bb	
#c0fa	#1051	
#c0f9	#c0fd	
#c0f8	#a0bc	
#c0f7	????	
#c0f6	????	

Twoja odpowiedź jest poprawna.

The correct answer is:

The organization of memory and processor is word-based. A word means 16 bits (int also takes 1 16-bit word). Hexadecimal values are preceded by a # character.

variable a has the value #a0c0

top of the stack (full descending, i.e. the stack pointer points to the most recently put element on the stack, and the stack expands towards lower addresses) #c100

stack frame before subroutine B call #c1010

address of subroutine B #1021

Calling rules: Parameters are put on the stack in accordance with the convention of the C language, i.e. starting from the last one, without a static connection, the result of the function is passed in registers. The stack is shown after subroutine B is called by itself (recursively), at label point C. Subroutine B is called for the first time B(a-2); somewhere in the program from address #1011. Label C has address #1050.

regardless of the programming language, subroutine B has the form

```
B(int i);
```

```
{
```

```
    int p=i+1;
```

```
C:    B(i-3);
```

```
}
```

The content of the cell at address #c0ff:[parameter]

Address	content	
#c100	????	
#c0ff	#a0be	
#c0fe	#1012	
#c0fd	#c010	
#c0fc	#a0bf	
#c0fb	#a0bb	
#c0fa	#1051	
#c0f9	#c0fd	
#c0f8	#a0bc	
#c0f7	????	
#c0f6	????	

<b>Started on</b>	Tuesday, 10 June 2025, 12:28 AM
<b>State</b>	Finished
<b>Completed on</b>	Tuesday, 10 June 2025, 12:32 AM
<b>Time taken</b>	4 mins 19 secs
<b>Marks</b>	2.00/4.00
<b>Grade</b>	0.01 out of 0.01 (50%)

**Question 1**

Incorrect

Mark 0.00 out of 1.00

Assuming that memory cells are 8-byte, the page number in the address field is 13 bits, the offset is 12 bits, the frame number is 11 bits, and all entries in the TIS page index table are on an 8-byte word boundary, please specify the maximum size of the physical memory in MB

Answer:

4



The number of frames is 2048 (11 bits), and the frame size is 4096 cells (12-bit address), so the maximum number of cells in physical memory is 8M cells (1023).

Because the cells are 8-byte, the maximum memory size is  $8M \times 8B = 64MB$

The correct answer is: 64

**Question 2**

Incorrect

Mark 0.00 out of 1.00

Assuming that memory cells are 4-byte, the page number in the address field is 13 bits, the offset is 12 bits, the frame number is 11 bits, and all entries in the TIS page index table are on an 8-byte word boundary, please specify the maximum size of the physical memory in MB

Answer:

8



The number of pages is 8096 (13 bits), and the frame size is 4096 cells (12-bit address), so the maximum number of cells in virtual memory is 32M cells ( $2^{25}$ ).

Because the cells are 4-byte, the maximum memory size is  $32M \times 4B = 128MB$

The correct answer is: 128

**Question 3**

Correct

Mark 1.00 out of 1.00

The virtual address consists of 8b page number and 8b offset. The page index table is shown below (index, content). For decimal address 898, binary 0000 0011 1000 0011, enter the physical address in the form: frame number.offset (as decimal numbers, offset in 3 digits ). For example, for a physical address consisting of frame 0 and offset 18, specify 0.018. If there is no physical address for the given virtual address, then -1 should be specified.

3	15
2	0
1	-1
0	-1

Answer: 15.131



The address is divided into 8b page number: 0000 0011, and 8b offset: 1000 0011.

In decimal, they are 3 and 131.

Under index 3, in PIT there is frame number 15. Therefore, the solution is 15.131

The correct answer is: 15.131

**Question 4**

Correct

Mark 1.00 out of 1.00

Assuming that memory cells are 8-byte, the page number in the address field is 13 bits, the offset is 12 bits, the frame number is 11 bits, and all entries in the TIS page index table are on a 4-byte word boundary, please specify the size of the Page Index Table PIT in KB

Answer: 16



The number of pages is 4096 (12 bits), and the PIT cell size is 4 bytes, so the size of PIT is  $4K \times 4B = 16KB$

The correct answer is: 16

<b>Started on</b>	Tuesday, 10 June 2025, 12:13 AM
<b>State</b>	Finished
<b>Completed on</b>	Tuesday, 10 June 2025, 12:22 AM
<b>Time taken</b>	9 mins 4 secs
<b>Marks</b>	3.00/5.00
<b>Grade</b>	0.01 out of 0.01 (60%)

**Question 1**

Incorrect

Mark 0.00 out of 1.00

For the disk operation scheduling Cyclic SCAN method, the currently being executed operation is in 37 cylinder. The direction in the Cyclic SCAN method is descending. The next scheduled operations (in the order of their queuing) are:

Operation number	1	2	3
Cylinder number	48	29	34

Enter the number of the next operation.

Answer: 2



The next operation is in a closest cylinder in the descending direction, that is number 3 - cylinder 27

The correct answer is: 3

**Question 2**

Correct

Mark 1.00 out of 1.00

For the disk operation scheduling Cyclic SCAN method, the currently being executed operation is in 21 cylinder. The direction in the Cyclic SCAN method is ascending. The next scheduled operations (in the order of their queuing) are:

Operation number	1	2	3
Cylinder number	18	29	34

Which disk operation will directly precede the operation on cylinder 18? Provide the number of the operation.

Answer: 3



After executing all operations in cylinders of greater numbers than current (or equal), the head will be moved to the cylinder of the smallest number in the orders (which is 18). The greatest cylinder number in the orders is 34 - order number 3

The correct answer is: 3

**Question 3**

Incorrect

Mark 0.00 out of 1.00

For the disk operation scheduling SCAN method, the currently being executed operation is in 30 cylinder. The direction in the SCAN method is descending. The next scheduled operations (in the order of their queuing) are:

Operation number	1	2	3
Cylinder number	48	21	34

Provide the number of the next operation.

Answer: 3



Because the current direction is descending, the operation will be chosen in the closest cylinder with a smaller (or equal) number: cylinder 21 (number 2).

The correct answer is: 2

**Question 4**

Correct

Mark 1.00 out of 1.00

For the disk operation scheduling SCAN method, the currently being executed operation is in 31 cylinder. The direction in the SCAN method is descending. The next scheduled operations (in the order of their queuing) are:

Operation number	1	2	3
Cylinder number	48	29	34

After which disk operation the current scan direction will change? Provide the number of the operation after which the direction will change.

Answer:

2



All the operations on smaller cylinder numbers will be executed before the direction change. The smallest one is in cylinder 29 - number 2

The correct answer is: 2

**Question 5**

Correct

Mark 1.00 out of 1.00

For the disk operation scheduling SSTF method, the currently being executed operation is in 30 cylinder. The next scheduled operations (in the order of their queuing) are:

Operation number	1	2	3
Cylinder number	48	29	34

Provide the number of the next operation.

Answer:

2



In SSTF, the next operation will be executed in the cylinder closest to the current one: this is cylinder 29 (operation 2).

The correct answer is: 2

<b>Started on</b>	Tuesday, 10 June 2025, 12:04 AM
<b>State</b>	Finished
<b>Completed on</b>	Tuesday, 10 June 2025, 12:12 AM
<b>Time taken</b>	8 mins 23 secs
<b>Marks</b>	5.00/6.00
<b>Grade</b>	8.33 out of 10.00 (83.33%)

**Question 1**

Correct

Mark 1.00 out of 1.00

0

3            0    — →    1

2

page	0	1	2	3
R bit	1	1	0	1

Using the above list for the Clock swapping algorithm, which page will be sent to the disk first? Provide a page number.

The current position of the "arrow" is 1, and the algorithm works clockwise.

Answer:

2



The algorithm starts from the current position - page 1 . It has R=1, so it receives R-9 and the clock hand moves to page 2. It has R=0, so this page is selected for swapping.

The correct answer is: 2

**Question 2**

Incorrect

Mark 0.00 out of 1.00

page nr	1	2	3	4
loaded	6	12	33	56
R bit	1	1	1	0

Using the above list for the FIFO-second chance swapping algorithm, what will be the bottom row after page replacement execution? The middle row is the number of a time slice in which a page was loaded to a frame. Provide a sequence of bits R for the pages; for example, before page replacement, the bottom row has the image 1110. We assume that the loaded page gets R=0.

Answer:

0



The 2-chance algorithm first looks at R in the oldest page (1). It is 1, so this page is moved to the opposite end of the queue, and R is cleared to this page. At this moment the bottom row is 11100. The algorithm continues searching, and finally, it finds page 4 with R=0 and replaces it. The loaded page receives R=0, so the bottom row remains 1100.

The correct answer is: 1100

**Question 3**

Correct

Mark 1.00 out of 1.00

page	history of R
0	11
1	01
2	00
3	10

Using the above table of the history of R bit for the pages in LFU swapping, which page will be sent to the disk first? The oldest bit R is on the left. Provide a page number.

Answer:

2



Page 2 has the smallest number of 1s, so it will be swapped.

The correct answer is: 2

**Question 4**

Correct

Mark 1.00 out of 1.00

		page		
		0	1	2
page	0	0	1	0
	1	0	0	1
	2	1	1	1

Using the above table for hardware-based implementation of LRU swapping, which page will be sent to the disk first? Provide a page number.

Answer:

1



Row 1, interpreted as a binary number (001), is the smallest one, so page 1 will be swapped first.

The correct answer is: 1

**Question 5**

Correct

Mark 1.00 out of 1.00

page	history of R
0	11
1	00
2	01
3	10

Using the above table of the history of R bit for the pages in LRU swapping, which page will be sent to the disk first? The oldest bit R is on the left. Provide a page number.

Answer:

1



Page 1 has the longest number of 0s, so it will be swapped.

The correct answer is: 1

**Question 6**

Correct

Mark 1.00 out of 1.00

page	Last used	Bit R
1	89	1
2	91	0
3	87	0
4	92	0

Using the above table of the history of R bit for the pages in Workset swapping algorithm, which page will be sent to the disk first? The current time slice number is 95, and the time range  $\tau$  for the workset is 5 (the threshold  $95-\tau=90$ ). Page scan starts from the top. Provide a page number to be sent to the disk.

Answer:

3



The first page with R=0 out of the workset is 3 with timestamp 87.

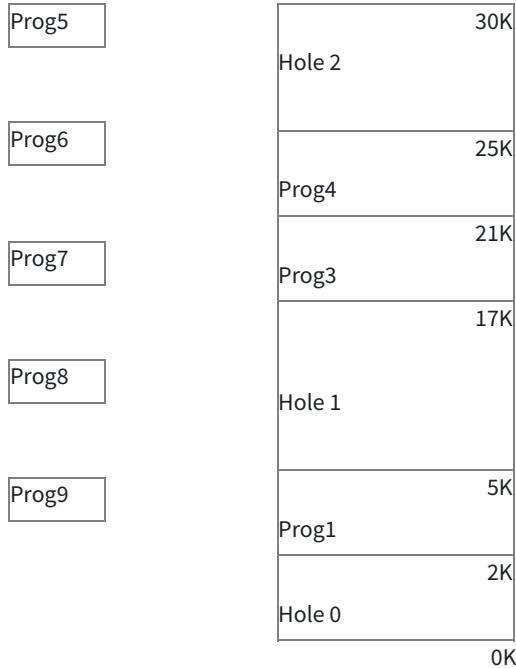
The correct answer is: 3

<b>Started on</b>	Tuesday, 6 May 2025, 11:28 AM
<b>State</b>	Finished
<b>Completed on</b>	Tuesday, 6 May 2025, 11:33 AM
<b>Time taken</b>	5 mins 7 secs
<b>Marks</b>	3.00/7.00
<b>Grade</b>	0.00 out of 0.01 ( <b>42.86%</b> )

**Question 1**

Correct

Mark 1.00 out of 1.00



The numbers on the right are the addresses that finish the program/hole areas, so the area size is the difference between the upper address and the lower address.

In the above memory allocation state, 3 programs are already in memory, and 5 programs are waiting to be loaded into the memory, in the order of their numbers,. The programs waiting to be loaded into memory have the following sizes:

prog5 - 2K  
prog6 - 6K  
prog7 - 4K  
prog8 - 7K  
prog9 - 4K

The memory is allocated to the programs in the first-fit rule, starting from lower addresses, with making a new hole if the allocated block is larger than the demand.

The programs are loaded into the memory in the order of their numbers (from 5 to 9).

Specify, which program will cause the memory compaction. Provide only the program number. If the compaction will not be needed, provide 0.

Answer:

8



Program 5 fits to hole 0, leaving no room.

Program 6 fits to hole 1, reducing this hole to size 6K.

Program 7 fits to hole 1, reducing its size to 2K.

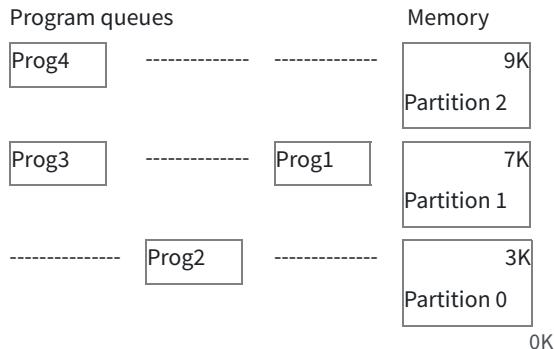
Program 8 does not fit to hole 1 (2K) and to hole 2 (5K), causing the compaction.

The correct answer is: 8

**Question 2**

Incorrect

Mark 0.00 out of 1.00



The numbers on the right are the addresses that finish the partitions, so the partition size is the difference between the upper address and the lower address.

In the above memory division, the programs waiting to be loaded into memory have the following sizes:

prog1 - 4K  
prog2 - 3K  
prog3 - 2K  
prog4 - 4K

The programs are loaded into memory partitions (if possible) in the order of their numbers, from 1 to 4.

Specify, which program will face the internal fragmentation problem as the first. Provide only the program number. If the internal fragmentation cannot occur, enter 0.

Answer:  ✖

Program 1 fits the partition 1 size - no internal fragmentation.

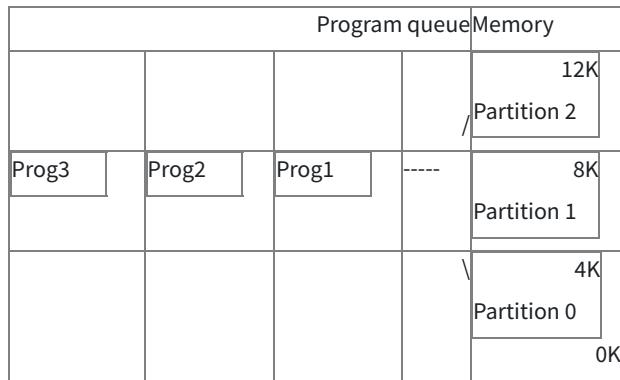
Program 2 is smaller than partition 0 size - it causes internal fragmentation.

The correct answer is: 2

**Question 3**

Correct

Mark 1.00 out of 1.00



The numbers on the right are the addresses that finish the partitions, so the partition size is the difference between the upper address and the lower address.

In the above memory division, the programs waiting to be loaded into memory have the following sizes:

prog1 - 5K  
 prog2 - 4K  
 prog3 - 3K

Programs are loaded into memory partitions (if possible) in the order of their numbers, from 1 to 3.

Specify, which program will face the internal fragmentation problem as the first. Provide only the program number. If the internal fragmentation cannot occur, enter 0.

Answer:  ✓

Program 1 is greater than the partition size - it will not be executed

Program 2 fits the partition size - no internal fragmentation.

Program 3 is smaller than the partition size - it causes internal fragmentation.

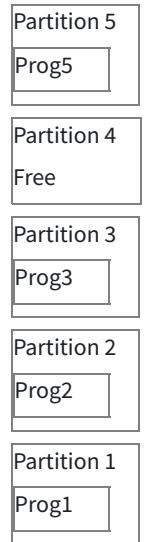
The correct answer is: 3

**Question 4**

Incorrect

Mark 0.00 out of 1.00

## Memory



In the above memory allocation state, partition 4 is a hole, and there are partitions 1...3,5 that are occupied by programs. Starting from the current while, some programs finish their work and release their partitions in the order: prog5, prog3, prog1. Free neighboring partitions are merged.

Specify the first program termination that causes external fragmentation. Provide the number of this program. If external fragmentation will not occur, enter 0.

Answer:

3



Program 5 and Program 3 stick to the free partition, so their partitions are merged with Partition 4.

Partition 1 is distant from the hole (there is Partition 2 in between), so the termination of Program 1 causes a separate hole.

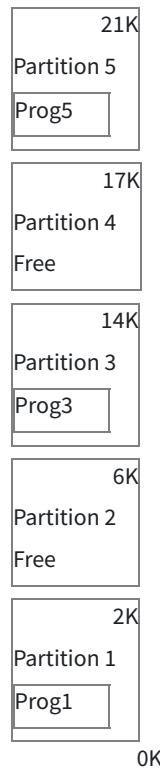
Occurring of two separate memory holes causes eternal fragmentation.

The correct answer is: 1

**Question 5**

Incorrect

Mark 0.00 out of 1.00

**Memory**

The numbers on the right are the addresses that finish the partitions, so the partition size is the difference between the upper address and the lower address.

In the above memory allocation state, 4 programs are already in memory, and 5th program is waiting to be loaded into the memory.

The memory is allocated to the programs in the best-fit rule, without making a new hole if the allocated block is larger than the demand.

What will be the internal fragmentation after loading the program Prog4 of size 2K into memory?

Answer:

2



Both Partition 2 and Partition 4 fit the requirements of Prog4, but Partition 4 has a smaller size, so it will receive the program, and the fragmentation will be 1K (3-2).

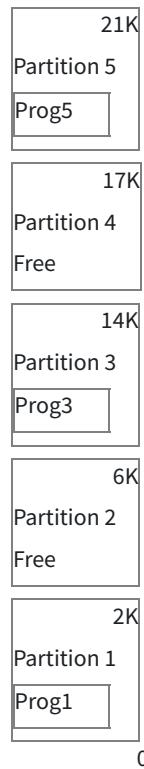
The correct answer is: 1

**Question 6**

Correct

Mark 1.00 out of 1.00

Memory



The numbers on the right are the addresses that finish the partitions, so the partition size is the difference between the upper address and the lower address.

In the above memory allocation state, 4 programs are already in memory, and 5th program is waiting to be loaded into the memory.

The memory is allocated to the programs in the first-fit rule, without making a new hole if the allocated block is larger than the demand. The memory is scanned for the fitting hole starting from the higher addresses.

What will be the internal fragmentation after loading the program Prog4 of size 4K into memory?

Answer:

0



Partition 4 has size 3K, so it is too small. Partition 2 fits the requirement, so the program arrives here. The partition size is equal to the program, so the fragmentation will be 0 (4-4).

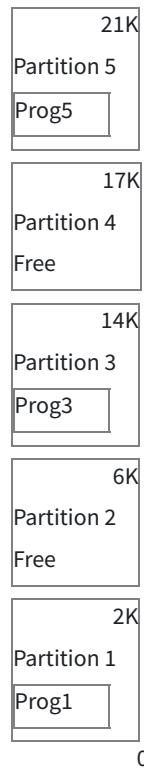
The correct answer is: 0

**Question 7**

Incorrect

Mark 0.00 out of 1.00

Memory



The numbers on the right are the addresses that finish the partitions, so the partition size is the difference between the upper address and the lower address.

In the above memory allocation state, 4 programs are already in memory, and 5th program is waiting to be loaded into the memory.

The memory is allocated to the programs in the worst-fit rule, without making a new hole if the allocated block is larger than the demand.

What will be the internal fragmentation after loading the program Prog4 of size 2K into memory?

Answer:

6



Both Partition 2 and Partition 4 fit the requirements of Prog4, but Partition 4 has a larger size, so it will receive the program, and the fragmentation will be 2K (4-2).

The correct answer is: 2

<b>Started on</b>	Tuesday, 6 May 2025, 10:58 AM
<b>State</b>	Finished
<b>Completed on</b>	Tuesday, 6 May 2025, 11:23 AM
<b>Time taken</b>	24 mins 59 secs
<b>Marks</b>	8.48/10.00
<b>Grade</b>	0.01 out of 0.01 (84.78%)

**Question 1**

Partially correct

Mark 0.54 out of 1.00

We have a buffer of capacity N=70, and two processes of producers A and B. Producer A produces the letter A, and producer B produces the letter B.

Complete the code of the prodA and prodB functions, which will be cyclically called by producer A and producer B, respectively.

Each function call concerns 1 element. Semaphores with initialization, p, v operations should be used.

When using semaphores, it is necessary to ensure synchronization of access to the buffer so that letters are placed in it according to the sequence:

AABBBAABBBAAABBBAAABBB .....

```
binsem mutex = 1, semA = 0; semB = 0;
```

```
int count= 0 ✓ ;countA= 0 ✓ ;countB= 0 ✗ ;
```

```
bool waitA=false, waitB=false;
```

```
void prodA() {
    mutex.P;
    if ((count == N) || ( countA == 2 )) {
        waitA = true;
        mutex.V;
        semA.P;
        waitA = false;
    }
}
```

//produce an element

```
count += 1;
```

```
countA += 1 ✓ ;
```

```
if (waitB && (count<N) && ( countB == 3 )) {
```

```
    countA ✗ = 3 ✗ ;
```

```
    semB.V;
```

```
    mutex.P;
```

```
}
```

```
    mutex.V;
```

```
}
```

```
void prodB() {
```

```

mutex.P;

if ( (count == N) || ( countB == 3 ) ) {

    waitB = true;

    mutex.V;

    semB.P;

    waitB = false;

}

//produce an element

count += 1;

countB += 1 ✓ ;

if (waitA && (count<N) && ( countB == 0 ) ) {

    countA ✓ = -1 ✗ ;

    semA.V;

    mutex.P;

}

mutex.V
}

```

Twoja odpowiedź jest częściowo poprawna.

You have correctly selected 7.

The correct answer is:

We have a buffer of capacity  $N=70$ , and two processes of producers A and B. Producer A produces the letter A, and producer B produces the letter B.

Complete the code of the prodA and prodB functions, which will be cyclically called by producer A and producer B, respectively.

Each function call concerns 1 element. Semaphores with initialization, p, v operations should be used.

When using semaphores, it is necessary to ensure synchronization of access to the buffer so that letters are placed in it according to the sequence:

AABBBAABBBAABBBABBB .....

```
binsem mutex = 1, semA = 0, semB = 0;
```

```
int count=[0]; countA=[0]; countB=[3];
```

```
bool waitA=false, waitB=false;
```

```

void prodA() {

    mutex.P;

    if ( (count == N) || ([countA == 2]) ) {

        waitA = true;

        mutex.V;

        semA.P;
}

```

```
waitA = false;
}

//produce an element
count += 1;
[countA += 1];

if (waitB && (count<N) && ([countA == 2])) {
    [countB] = [0];
    semB.V;
    mutex.P;
}
mutex.V;

}

void prodB() {
    mutex.P;
    if ( (count == N) || ([countB == 3])) {
        waitB = true;
        mutex.V;
        semB.P;
        waitB = false;
    }
    //produce an element
    count += 1;
    [countB += 1];
    if (waitA && (count<N) && ([countB == 3])) {
        [countA] = [0];
        semA.V;
        mutex.P;
    }
    mutex.V;
}
```

**Question 2**

Correct

Mark 1.00 out of 1.00

We have a buffer of capacity N=25, and two processes of producers A and B. Producer A produces the letter A, and producer B produces the letter B.

Complete the code of the prodA and prodB functions, which will be cyclically called by producer A and producer B, respectively.

Each function call concerns 1 element. Semaphores with init, p, v operations should be used.

When using semaphores, it is necessary to ensure synchronization of access to the buffer so that letters are placed in it according to the sequence:

AABBBBAABBBBAABBBBAABBBB.....

```
binsem semA = [1] ✓ , semB = [0] ✓ ;
sem semFull = [25] ✓ , semEmp = [0] ✓ ;
int countA = [0] ✓ , countB = [0] ✓ ;
```

```
void prodA() {
```

```
    semFull.P;
    semA.P;
    //produce an element
```

```
    countA += [1] ✓ ;
    if (countA == [2] ✓ )
    { countB = [0] ✓ ; semB.V; }
```

```
    else
```

```
        semA.V;
        semEmp.V;
```

```
}
```

```
void prodB() {
```

```
    semFull.P;
    semB.P;
    //produce an element
```

```
    countB += [1] ✓ ;
    if (countB == [4] ✓ )
    { countA = [0] ✓ ; semA.V; }
```

```

else

semB.V;

semEmp.V;

}

```

Twoja odpowiedź jest poprawna.

The correct answer is:

We have a buffer of capacity N=25, and two processes of producers A and B. Producer A produces the letter A, and producer B produces the letter B.

Complete the code of the prodA and prodB functions, which will be cyclically called by producer A and producer B, respectively.

Each function call concerns 1 element. Semaphores with init, p, v operations should be used.

When using semaphores, it is necessary to ensure synchronization of access to the buffer so that letters are placed in it according to the sequence:

AABBBBAABBBBAABBBBAABBBB .....

```
binsem semA = [1], semB = [0];
```

```
sem semFull = [25], semEmp = [0];
```

```
int countA = [0], countB = [0];
```

```

void prodA() {
    semFull.P;
    semA.P;
    //produce an element
    countA += [1];
    if (countA == [2])
        { countB = [0]; semB.V; }
    else
        semA.V;
    semEmp.V;
}

```

```

void prodB() {
    semFull.P;
    semB.P;
    //produce an element
    countB += [1];
    if (countB == [4])
        { countA = [0]; semA.V; }
    else
        semB.V;
    semEmp.V;
}

```



**Question 3**

Partially correct

Mark 0.73 out of 1.00

We have a buffer of capacity N=25, and two processes of producers A and B. Producer A produces the letter A, and producer B produces the letter B.

Complete the code of the prodA and prodB functions, which will be cyclically called by producer A and producer B, respectively.

Each function call concerns 1 element. Semaphores with init, p, v operations should be used.

When using semaphores, it is necessary to ensure synchronization of access to the buffer so that letters are placed in it according to the sequence:

AABBBBAABBBBAABBBBAABBBB.....

```
binsem semA = [1] ✓ , semB = [0] ✓ ;
sem semFull = [25] ✓ , semEmp = [0] ✓ ;
int countA = [1] ✗ , countB = 0;
```

```
void prodA() {
```

```
    semFull.P;
```

```
    semA.P;
```

```
    //produce an element
```

```
    countA -= [2] ✗ ;
    if (countA == [1] ✗ )
    { countB = [4] ✓ ; semB.V; }
```

```
    else
```

```
        semA.V;
```

```
        semEmp.V;
```

```
}
```

```
void prodB() {
```

```
    semFull.P;
```

```
    semB.P;
```

```
    //produce an element
```

```
    countB -= [1] ✓ ;
    if (countB == [0] ✓ )
    { countA = [2] ✓ ; semA.V; }
```

```
else  
    semB.V;  
semEmp.V;  
}
```

Twoja odpowiedź jest częściowo poprawna.

You have correctly selected 8.

The correct answer is:

We have a buffer of capacity N=25, and two processes of producers A and B. Producer A produces the letter A, and producer B produces the letter B.

Complete the code of the prodA and prodB functions, which will be cyclically called by producer A and producer B, respectively.

Each function call concerns 1 element. Semaphores with init, p, v operations should be used.

When using semaphores, it is necessary to ensure synchronization of access to the buffer so that letters are placed in it according to the sequence:

AABBBBAABBBBAABBBBAABBBB .....

```
binsem semA = [1], semB = [0];  
sem semFull = [25], semEmp = [0];  
int countA = [2], countB = 0;
```

```
void prodA() {
```

```
    semFull.P;  
    semA.P;  
    //produce an element  
    countA -= [1];  
    if (countA == [0])  
    { countB = [4]; semB.V; }  
    else  
        semA.V;  
    semEmp.V;  
}
```

```
void prodB() {
```

```
    semFull.P;  
    semB.P;  
    //produce an element  
    countB -= [1];  
    if (countB == [0])  
    { countA = [2]; semA.V; }  
    else  
        semB.V;  
    semEmp.V;  
}
```



**Question 4**

Partially correct

Mark 0.53 out of 1.00

We have a buffer of capacity  $N=70$ , and two processes of producers A and B. Producer A produces the letter A, and producer B produces the letter B.

Complete the code of the prodA and prodB functions, which will be cyclically called by producer A and producer B, respectively.

Each function call concerns 1 element. Semaphores with initialization, P and V operations should be used.

When using semaphores, it is necessary to ensure synchronization of access to the buffer so that letters are placed in it according to the sequence:

AABBAABBAABBAABB .....

binsem mutex =  ✓ , semA =  ✗ ; semB =  ✓ ;

int count = 0; countA = 0, countB = 3;

bool waitA=false, waitB=false;

void prodA() {

✓ ;

if ( (count == N) || (countA == 2) ) {

waitA = true;

✗ ;

✗ ;

waitA = false;

}

//produce an element

count += 1;

countA += 1;

if (waitB && (count>N) && (countA == 2) ) {

countB=0;

✗ ;

✗ ;

}

✗ ;

}

void prodB() {

```

mutex.P ✓ ;
if( (count == N) || (countB == 3)) {
    waitB = true;
    mutex.P ✗ ;
    mutex.V ✓ ;
    waitB = false;
}
//produce an element
count += 1;
countB += 1;
if (waitA && (count<N) && (countB == 3)) {
    countA = 0;
    semA.V ✓ ;
    mutex.P ✓ ;
}
mutex.V ✓ ;
}

```

Twoja odpowiedź jest częściowo poprawna.

You have correctly selected 8.

The correct answer is:

We have a buffer of capacity N=70, and two processes of producers A and B. Producer A produces the letter A, and producer B produces the letter B.

Complete the code of the prodA and prodB functions, which will be cyclically called by producer A and producer B, respectively.

Each function call concerns 1 element. Semaphores with initialization, P and V operations should be used.

When using semaphores, it is necessary to ensure synchronization of access to the buffer so that letters are placed in it according to the sequence:

AABBAABBAABBAABB .....

```

binsem mutex = [1], semA = [0]; semB = [0];
int count = 0; countA = 0, countB = 3;
bool waitA=false, waitB=false;

```

```

void prodA() {
    [mutex.P];
    if( (count == N) || (countA == 2)) {
        waitA = true;
        [semA.P];
        [mutex.V];
    }
}

```

```
waitA = false;  
}  
  
//produce an element  
count += 1;  
countA += 1;  
  
if (waitB && (count>N) && (countA == 2)) {  
    countB=0;  
    [semB.V];  
    [mutex.P];  
}  
[mutex.V];  
}  
  
void prodB() {  
    [mutex.P];  
    if ( (count == N) || (countB == 3)) {  
        waitB = true;  
        [semB.P];  
        [mutex.V];  
        waitB = false;  
    }  
    //produce an element  
    count += 1;  
    countB += 1;  
    if (waitA && (count<N) && (countB == 3)) {  
        countA = 0;  
        [semA.V];  
        [mutex.P];  
    }  
    [mutex.V];  
}
```

**Question 5**

Partially correct

Mark 0.93 out of 1.00

We have a buffer of capacity N=60, and two processes of producers A and B. Producer A produces the letter A, and producer B produces the letter B.

Complete the code of the prodA and prodB functions, which will be cyclically called by producer A and producer B, respectively.

Each function call concerns 1 element. Semaphores with initialization, P and V operations should be used.

When using semaphores, it is necessary to ensure synchronization of access to the buffer so that letters are placed in it according to the sequence:

AABBAABBAABBAABB .....

```
binsem mutex = 1, semA = 0; semB = 0;
```

```
int count = 0; countA = 0 ✓ ; countB=2;
```

```
bool waitA = false ✓ , waitB=false;
```

```
void prodA() {
```

```
    mutex.P;
```

```
    if ( (count == N) && (countA == 2) ✗ ) {
```

```
        waitA = true ✓ ;
```

```
        mutex.V;
```

```
        semA.P;
```

```
        waitA = false ✓ ;
```

```
}
```

```
//produce an element
```

```
    count += 1;
```

```
    countA += 1 ✓ ;
```

```
    if ( waitB && (N>count) && (countA == 2) ✓ ) {
```

```
        countB == 0 ✓ ;
```

```
        semB.V;
```

```
        mutex.P;
```

```
}
```

```
        mutex.V;
```

```
}
```

```
void prodB() {
```

```
mutex.P;
```

```
if( (count == N) || (countB == 2) ) { ✓ }
```

```
    waitB = true; ✓ ;
```

```
mutex.V;
```

```
semB.P;
```

```
    waitB = false; ✓ ;
```

```
}
```

```
//produce an element
```

```
count += 1;
```

```
    countB += 1; ✓ ;
```

```
if( waitA && (N>count) && (countB == 2) ) { ✓ }
```

```
    countA = 0; ✓ ;
```

```
semA.V;
```

```
mutex.P;
```

```
}
```

```
mutex.V;
```

```
}
```

Twoja odpowiedź jest częściowo poprawna.

You have correctly selected 13.

The correct answer is:

We have a buffer of capacity N=60, and two processes of producers A and B. Producer A produces the letter A, and producer B produces the letter B.

Complete the code of the prodA and prodB functions, which will be cyclically called by producer A and producer B, respectively.

Each function call concerns 1 element. Semaphores with initialization, P and V operations should be used.

When using semaphores, it is necessary to ensure synchronization of access to the buffer so that letters are placed in it according to the sequence:

AABBAABBAABBAABB .....

binsem mutex = 1, semA = 0; semB = 0;

int count = 0; [countA = 0]; countB=2;

bool [waitA = false], waitB=false;

```
void prodA() {
```

```
    mutex.P;
```

```
    if ((count == N) || (countA == 2)) {
```

```
        [waitA = true];
```

```
        mutex.V;
```

```
        semA.P;
```

```
[waitA = false];
}

//produce an element
count += 1;
[countA += 1];
if ([waitB && (N>count) && (countA == 2)]) {
    [countB == 0];
    semB.V;
    mutex.P;
}
mutex.V;
}

void prodB() {
    mutex.P;
    if ((count == N) || (countB == 2)) {
        [waitB = true];
        mutex.V;
        semB.P;
        [waitB = false];
    }
    //produce an element
    count += 1;
    [countB += 1];
    if ([waitA && (N>count) && (countB == 2)]) {
        [countA = 0];
        semA.V;
        mutex.P;
    }
    mutex.V;
}
```

**Question 6**

Correct

Mark 1.00 out of 1.00

We have a buffer of capacity N=20, and two processes of producers A and B. Producer A produces the letter A, and producer B produces the letter B.

Complete the code of the prodA and prodB functions, which will be cyclically called by producer A and producer B, respectively.

Each function call concerns 1 element. Semaphores with init, p, v operations should be used.

When using semaphores, it is necessary to ensure synchronization of access to the buffer so that letters are placed in it according to the sequence:

AABBAABBAABBAABB .....

```
binsem semA = 1, semB = 0;
```

```
sem semFull = 20, semEmp = 0;
```

```
int countA = 0, countB = 0;
```

```
void prodA() {
```

 semFull.P ;

 semA.P ;

//produce an element

```
countA += 1;
```

```
if (countA == 2)
```

```
{ countB = 0; semB.V ; }
```



```
else
```

 semA.V ;

 semEmp.V ;

```
}
```

```
void prodB() {
```

 semFull.P ;

 semB.P ;

//produce an element

```
countB += 1;
```

```
if (countB == 2)
```

```
{ countA = 0; semA.V ; }
```



```
else
```

```

    semB.V ✓ ;
    semEmp.V ✓ ;
}

```

Twoja odpowiedź jest poprawna.

The correct answer is:

We have a buffer of capacity N=20, and two processes of producers A and B. Producer A produces the letter A, and producer B produces the letter B.

Complete the code of the prodA and prodB functions, which will be cyclically called by producer A and producer B, respectively.

Each function call concerns 1 element. Semaphores with init, p, v operations should be used.

When using semaphores, it is necessary to ensure synchronization of access to the buffer so that letters are placed in it according to the sequence:

AABBAABBAABBAABB .....

```

binsem semA = 1, semB = 0;
sem semFull = 20, semEmp = 0;
int countA = 0, countB = 0;

```

```

void prodA() {
    [semFull.P];
    [semA.P];
    //produce an element
    countA += 1;
    if (countA == 2)
        { countB = 0; [semB.V]; }
    else
        [semA.V];
    [semEmp.V];
}

```

```

void prodB() {
    [semFull.P];
    [semB.P];
    //produce an element
    countB += 1;
    if (countB == 2)
        { countA = 0; [semA.V]; }
    else
        [semB.V];
    [semEmp.V];
}

```

**Question 7**

Correct

Mark 1.00 out of 1.00

We have a buffer of capacity N=50, and two processes of producers A and B. Producer A produces the letter A, and producer B produces the letter B.

Complete the code of the prodA and prodB functions, which will be cyclically called by producer A and producer B, respectively.

Each function call concerns 1 element. Semaphores with init, p, v operations should be used.

When using semaphores, it is necessary to ensure synchronization of access to the buffer so that letters are placed in it according to the sequence:

AABBAABBAABBAABB .....

```
binsem semA = 1, semB = 0;
```

```
sem semFull = 50, semEmp = 0;
```

```
int countA = 2, countB = 0;
```

```
void prodA() {
```



```
    semFull.P ✓ ;
```



```
    semA.P ✓ ;
```

//produce an element

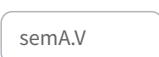
```
    countA -= 1;
```

```
    if (countA == 0)
```



```
    { countB = 2; semB.V ✓ ; }
```

```
    else
```



```
        semA.V ✓ ;
```



```
        semEmp.V ✓ ;
```

```
}
```

```
void prodB() {
```



```
    semFull.P ✓ ;
```



```
    semB.P ✓ ;
```

//produce an element

```
    countB -= 1;
```

```
    if (countB == 0)
```



```
    { countA = 2; semA.V ✓ ; }
```

```
    else
```

```
    semB.V ✓ ;  
    semEmp.V ✓ ;  
}
```

Twoja odpowiedź jest poprawna.

The correct answer is:

We have a buffer of capacity N=50, and two processes of producers A and B. Producer A produces the letter A, and producer B produces the letter B.

Complete the code of the prodA and prodB functions, which will be cyclically called by producer A and producer B, respectively.

Each function call concerns 1 element. Semaphores with init, p, v operations should be used.

When using semaphores, it is necessary to ensure synchronization of access to the buffer so that letters are placed in it according to the sequence:

AABBAABBAABBAABB .....

```
binsem semA = 1, semB = 0;  
sem semFull = 50, semEmp = 0;  
int countA = 2, countB = 0;
```

```
void prodA() {  
    [semFull.P];  
    [semA.P];  
    //produce an element  
    countA -= 1;  
    if (countA == 0)  
    { countB = 2; [semB.V]; }  
    else  
        [semA.V];  
    [semEmp.V];  
}
```

```
void prodB() {  
    [semFull.P];  
    [semB.P];  
    //produce an element  
    countB -= 1;  
    if (countB == 0)  
    { countA = 2; [semA.V]; }  
    else  
        [semB.V];  
    [semEmp.V];  
}
```

**Question 8**

Partially correct

Mark 0.92 out of 1.00

We have a buffer of capacity N=30, and two processes of producers A and B. Producer A produces the letter A, and producer B produces the letter B.

Complete the code of the prodA and prodB functions, which will be cyclically called by producer A and producer B, respectively.

Each function call concerns 1 element. Semaphores with init, p, v operations should be used.

When using semaphores, it is necessary to ensure synchronization of access to the buffer so that letters are placed in it according to the sequence:

ABBBABBBABBBABBB ....

```
binsem semA = 1, semB = 0;
```

```
sem semFull = 30, semEmp = 0;
```

```
int countA = 0, countB = 0;
```

```
void prodA() {
```

semFull.P ✓ ;

semA.P ✓ ;

//produce an element

```
countA += 1;
```

if ( countA==0 ✗ )

{ countB = 0;  semB.V ✓ ; }

else

semA.V ✓ ;

semEmp.V ✓ ;

}

```
void prodB() {
```

semFull.P ✓ ;

semB.P ✓ ;

//produce an element

```
countB += 1;
```

if ( countB==3 ✓ )

{ countA = 0;  semA.V ✓ ; }

```
else
    semB.V ✓ ;
    semEmp.V ✓ ;
}
```

Twoja odpowiedź jest częściowo poprawna.

You have correctly selected 11.

The correct answer is:

We have a buffer of capacity N=30, and two processes of producers A and B. Producer A produces the letter A, and producer B produces the letter B.

Complete the code of the prodA and prodB functions, which will be cyclically called by producer A and producer B, respectively.

Each function call concerns 1 element. Semaphores with init, p, v operations should be used.

When using semaphores, it is necessary to ensure synchronization of access to the buffer so that letters are placed in it according to the sequence:

ABBBABBBABBBABBB ....

```
binsem semA = 1, semB = 0;
sem semFull = 30, semEmp = 0;
int countA = 0, countB = 0;
```

```
void prodA() {
```

```
    [semFull.P];
    [semA.P];
```

```
    //produce an element
```

```
    countA += 1;
```

```
    if ([true])
```

```
    { countB = 0; [semB.V]; }
```

```
    else
```

```
        [semA.V];
```

```
        [semEmp.V];
```

```
}
```

```
void prodB() {
```

```
    [semFull.P];
```

```
    [semB.P];
```

```
    //produce an element
```

```
    countB += 1;
```

```
    if ([countB==3])
```

```
    { countA = 0; [semA.V]; }
```

```
    else
```

```
        [semB.V];
```

```
        [semEmp.V];
```

```
}
```



**Question 9**

Partially correct

Mark 0.92 out of 1.00

We have a buffer of capacity  $N=45$ , and two processes of producers A and B. Producer A produces the letter A, and producer B produces the letter B.

Complete the code of the prodA and prodB functions, which will be cyclically called by producer A and producer B, respectively.

Each function call concerns 1 element. Semaphores with init, p, v operations should be used.

When using semaphores, it is necessary to ensure synchronization of access to the buffer so that letters are placed in it according to the sequence:

ABBBABBBABBBABBB ....

```
binsem semA = 1, semB = 0;
```

```
sem semFull = 45, semEmp = 0;
```

```
int countA = 1, countB = 0;
```

```
void prodA() {
```

semFull.P ✓ ;

semA.P ✓ ;

//produce an element

```
countA -= 1;
```

if ( countA==1 ✗ )

{ countB = 3;  semB.V ✓ ; }

else

semA.V ✓ ;

semEmp.V ✓ ;

```
}
```

```
void prodB() {
```

semFull.P ✓ ;

semB.P ✓ ;

//produce an element

```
countB -= 1;
```

if ( countB==0 ✓ )

{ countA = 1;  semA.V ✓ ; }

```

else
    semB.V ✓ ;
    semEmp.V ✓ ;
}

```

Twoja odpowiedź jest częściowo poprawna.

You have correctly selected 11.

The correct answer is:

We have a buffer of capacity N=45, and two processes of producers A and B. Producer A produces the letter A, and producer B produces the letter B.

Complete the code of the prodA and prodB functions, which will be cyclically called by producer A and producer B, respectively.

Each function call concerns 1 element. Semaphores with init, p, v operations should be used.

When using semaphores, it is necessary to ensure synchronization of access to the buffer so that letters are placed in it according to the sequence:

ABBBABBBABBBABBB ....

```

binsem semA = 1, semB = 0;
sem semFull = 45, semEmp = 0;
int countA = 1, countB = 0;

```

void prodA() {

```

[semFull.P];
[semA.P];
//produce an element

```

```

countA -= 1;

```

```

if ([true])

```

```

{ countB = 3; [semB.V]; }

```

```

else

```

```

[semA.V];

```

```

[semEmp.V];

```

```

}

```

void prodB() {

```

[semFull.P];

```

```

[semB.P];

```

```

//produce an element

```

```

countB -= 1;

```

```

if ([countB==0])

```

```

{ countA = 1; [semA.V]; }

```

```

else

```

```

[semB.V];

```

```

[semEmp.V];

```

```

}

```



**Question 10**

Partially correct

Mark 0.92 out of 1.00

We have a buffer of capacity  $N=20$ , and two processes of consumers A and B. Consumer A consumes the letter A, and consumer B consumes the letter B.

Complete the code of the consA and consB functions, which will be cyclically called by consumer A and consumer B, respectively.

Each function call concerns 1 element. Semaphores with initialization, p, v operations should be used.

When using semaphores, it is necessary to ensure synchronization of access to the buffer so that letters are retrieved in it according to the sequence:

BAABAABAABAA .....

```
binsem semA = 0, semB = 1;
```

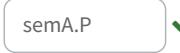
```
sem semFull = 20, semEmp = 0;
```

```
int countA = 0, countB = 0;
```

```
void consA() {
```



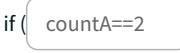
```
    semEmp.P ;
```



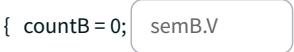
```
    semA.P ;
```

```
    //consume an element
```

```
    countA += 1;
```



```
    if (countA==2) ;
```



```
{ countB = 0; semB.V ; }
```

```
    else
```



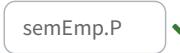
```
        semA.V ;
```



```
        semFull.V ;
```

```
}
```

```
void consB() {
```



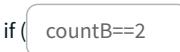
```
    semEmp.P ;
```



```
    semB.P ;
```

```
    //consume an element
```

```
    countB += 1;
```



```
    if (countB==2) ;
```



```
{ countA = 0; semA.V ; }
```

```

else
    semB.V ✓ ;
    semFull.V ✓ ;
}

```

Twoja odpowiedź jest częściowo poprawna.

You have correctly selected 11.

The correct answer is:

We have a buffer of capacity N=20, and two processes of consumers A and B. Consumer A consumes the letter A, and consumer B consumes the letter B.

Complete the code of the consA and consB functions, which will be cyclically called by consumer A and consumer B, respectively.

Each function call concerns 1 element. Semaphores with initialization, p, v operations should be used.

When using semaphores, it is necessary to ensure synchronization of access to the buffer so that letters are retrieved in it according to the sequence:

BAABABAABAA .....

```

binsem semA = 0, semB = 1;
sem semFull = 20, semEmp = 0;
int countA = 0, countB = 0;

```

```

void consA() {
    [semEmp.P];
    [semA.P];
    //consume an element
    countA += 1;
    if ([countA==2])
        { countB = 0; [semB.V]; }
    else
        [semA.V];
    [semFull.V];
}

```

```

void consB() {
    [semEmp.P];
    [semB.P];
    //consume an element
    countB += 1;
    if ([true])
        { countA = 0; [semA.V]; }
    else
        [semB.V];
    [semFull.V];
}

```



<b>Started on</b>	Tuesday, 6 May 2025, 10:20 AM
<b>State</b>	Finished
<b>Completed on</b>	Tuesday, 6 May 2025, 10:24 AM
<b>Time taken</b>	3 mins 30 secs
<b>Marks</b>	3.00/5.00
<b>Grade</b>	0.01 out of 0.01 (60%)

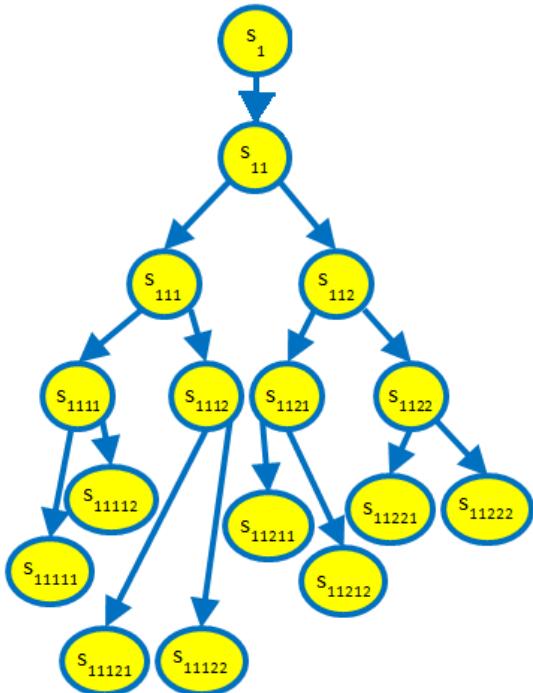
**Question 1**

Incorrect

Mark 0.00 out of 1.00

The following figure shows the static nesting structure of subroutines. Subroutine s11211 makes a call to the subroutine that is its "parent" in the hierarchy. To what stack frame (of which subroutine) will the dynamic link be made in the frame of the called subroutine?

Enter the name of the subroutine with the index, without the letter "s", e.g. for s1122 enter 1122



Answer:  ×

The dynamic link points always to the calling subroutine, so the solution is 11211.

The correct answer is: 11211

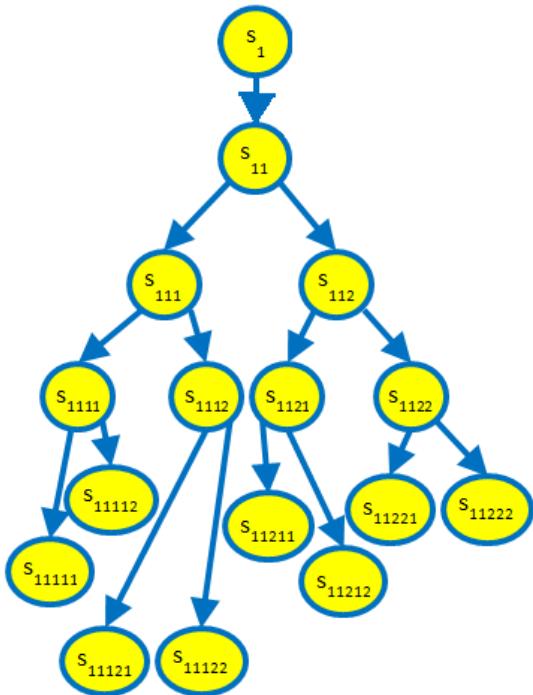
**Question 2**

Correct

Mark 1.00 out of 1.00

The following figure shows the static nesting structure of subroutines. In the stack frame of the subroutine s11221, can there be a dynamic link to the frame of the subroutine s11222?

answer 0-not, 1-yes



Answer:



From a subroutine, only its ancestors and children of its ancestors can be called. So, the subroutine s11222 cannot call the subroutine s11121 and the solution is 0.

The correct answer is: 0

**Question 3**

Incorrect

Mark 0.00 out of 1.00

The following figure shows the static nesting of subroutines. In the stack frame of the subroutine s112 can there be a dynamic link to the frame of the subroutine s11111?

answer 0-not, 1-yes



Answer:



From a subroutine, only its ancestors and children of its ancestors can be called. So, the subroutine s11111 can call the subroutine s112 and the solution is 1

The correct answer is: 1

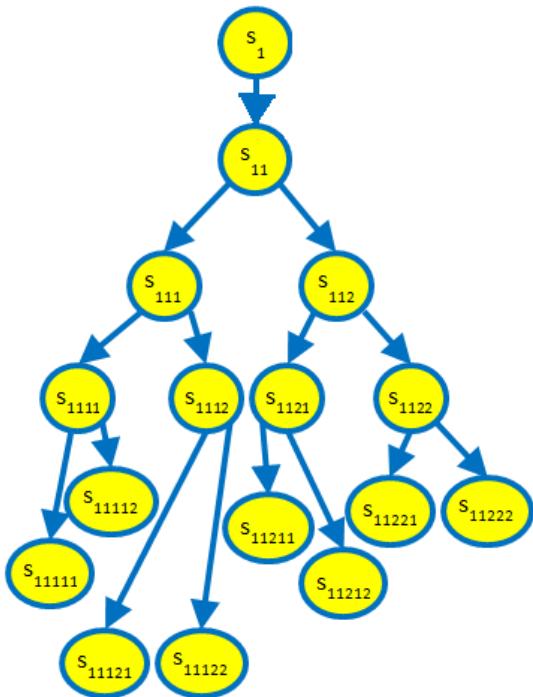
**Question 4**

Correct

Mark 1.00 out of 1.00

The figure shows the static nesting of subroutines. In the stack frame of the subroutine s112 can there be a dynamic link to the frame of the subroutine s111?

answer 0-not, 1-yes



Answer:



From a subroutine, only its ancestors and children of its ancestors can be called. So, the subroutine s111 cannot call the subroutine s112 and the solution is 0

The correct answer is: 0

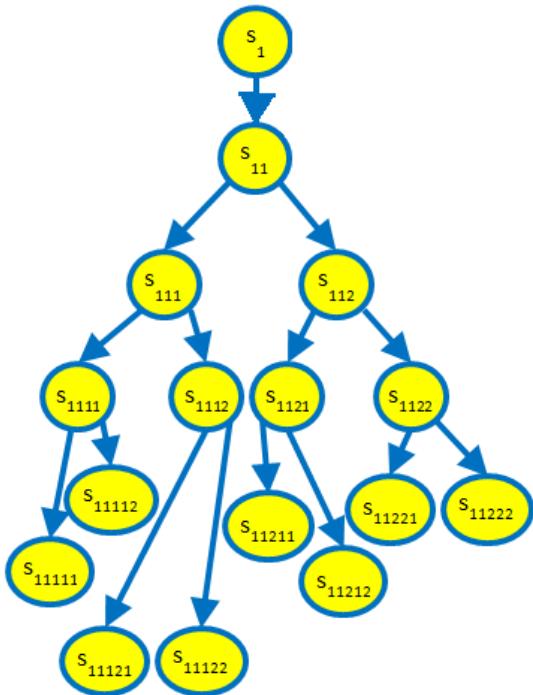
**Question 5**

Correct

Mark 1.00 out of 1.00

The following figure shows the static nesting structure of subroutines. Subroutine s11 makes a recursive call. To what stack frame (of which subroutine) will the dynamic link be made in the recursively called subroutine frame?

Enter the name of the subroutine with the index, without the letter "s", e.g. for s11122 enter 11122



Answer:

11



A dynamic points always to the stack frame of the calling subroutine, so in a recursive call it points to the stack frame of the previous incarnation of the same subroutine on the stack. In this case, s11

The correct answer is: 11

<b>Started on</b>	Tuesday, 6 May 2025, 10:30 AM
<b>State</b>	Finished
<b>Completed on</b>	Tuesday, 6 May 2025, 10:33 AM
<b>Time taken</b>	3 mins 13 secs
<b>Marks</b>	1.00/7.00
<b>Grade</b>	0.00 out of 0.01 (14.29%)

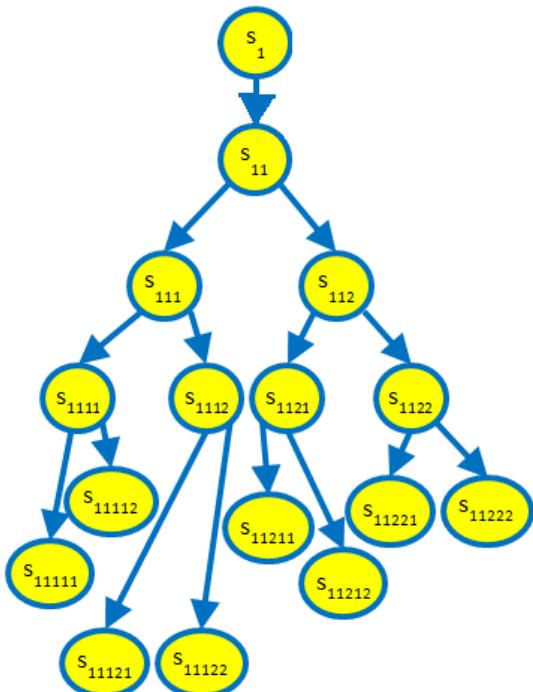
**Question 1**

Incorrect

Mark 0.00 out of 1.00

The following graph shows the static nesting structure of subprograms in a particular program.

The subroutine S111 is called from the subroutine S1111. In the frame of the S111 subroutine, the static link will be set to the frame of which subroutine (give the index)? If the call is impossible, enter index -1.



Answer: 1121



The static link points always to the parent of the called subroutine, so the solution is 11

The correct answer is: 11

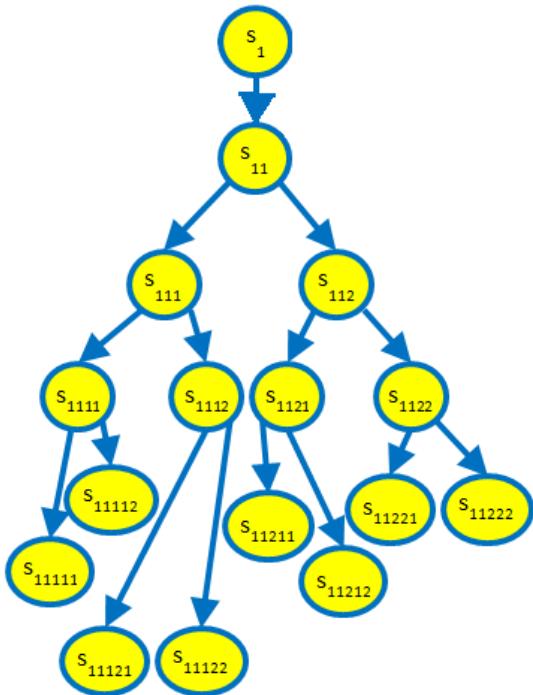
**Question 2**

Incorrect

Mark 0.00 out of 1.00

The following graph shows the static nesting structure of subprograms in a particular program.

The subroutine S111 is called from the subroutine S11. In the frame of the S111 subroutine, the static link will be set to the frame of which subroutine (give the index)? If the call is impossible, enter index -1.



Answer:  ×

The static link points always to the parent of the called subroutine, so the solution is 11

The correct answer is: 11

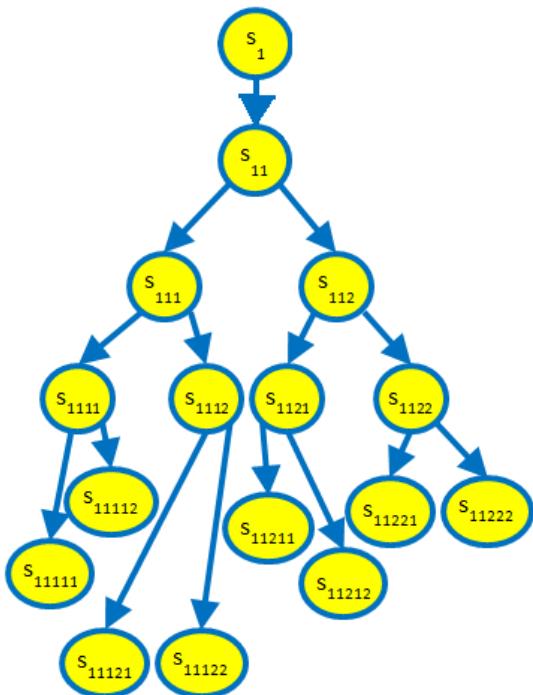
**Question 3**

Incorrect

Mark 0.00 out of 1.00

The following graph shows the static nesting structure of subprograms in a particular program.

The subroutine S1121 is called from the subroutine S11. In the frame of the S1121 subroutine, the static link will be set to the frame of which subroutine (give the index)? If the call is impossible, enter index -1.



Answer:  ✖

The subroutine S1121 cannot be called from the subroutine S11 (only the children, the subroutine recursively, and its ancestors can be called), so the solution is -1

The correct answer is: -1

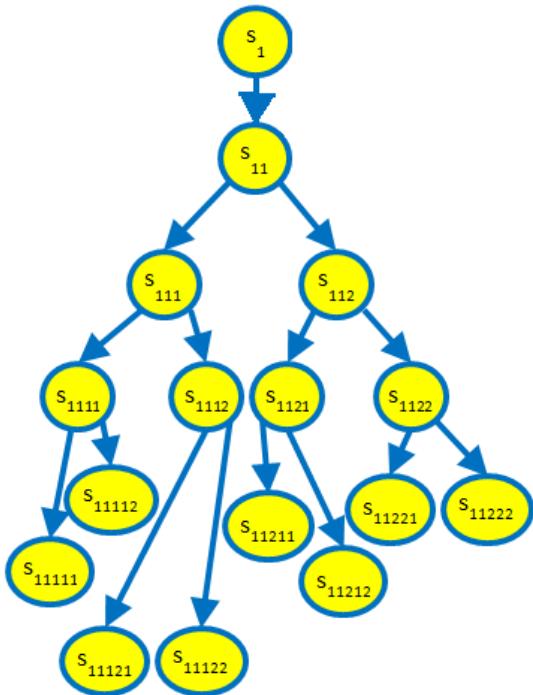
**Question 4**

Incorrect

Mark 0.00 out of 1.00

The following graph shows the static nesting structure of subprograms in a particular program.

The subroutine S11 is called from the subroutine S11211. In the frame of the S11 subroutine, the static link will be set to the frame of which subroutine (give the index)? If the call is impossible, enter index -1.



Answer:  ×

The static link points always to the parent of the called subroutine, so the solution is 1

The correct answer is: 1

**Question 5**

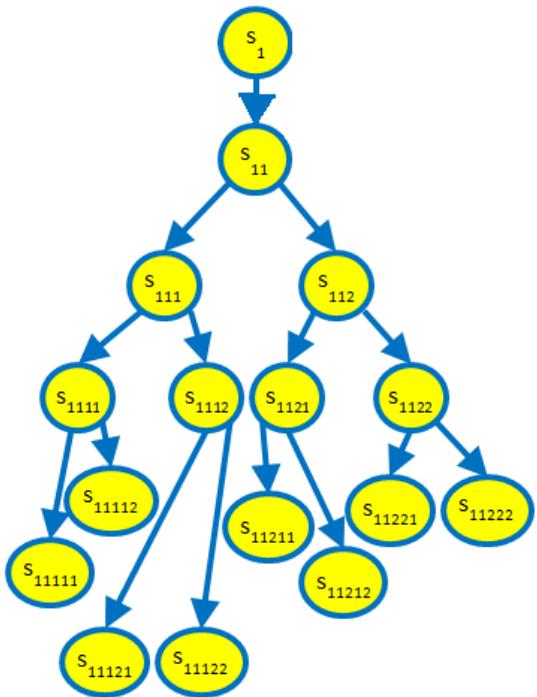
Incorrect

Mark 0.00 out of 1.00

The following graph shows the static nesting structure of subroutines in a particular program.

Can there be in the stack frame of subroutine S11221 a static link to subroutine frame S1122?

answer 0-no, 1-yes



Answer:



The static link points always to the parent of the called subroutine, and the subroutine S1122 is a parent of S11221, so the solution is 1 (yes)

The correct answer is: 1

**Question 6**

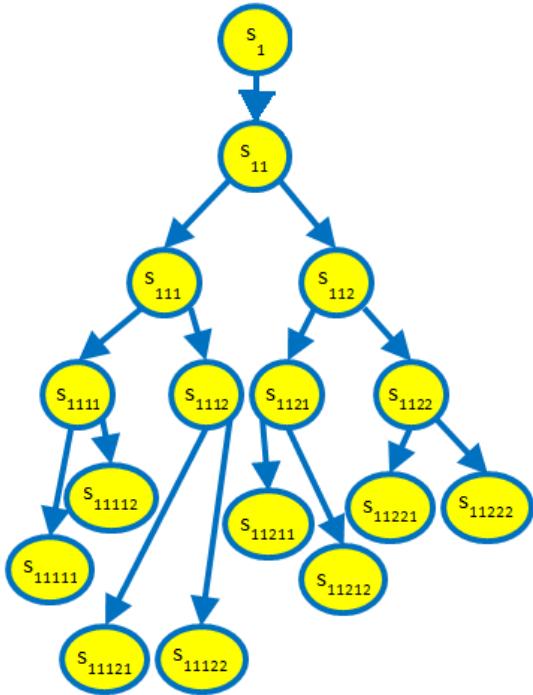
Incorrect

Mark 0.00 out of 1.00

The following graph shows the static nesting structure of subroutines in a particular program.

The subroutine S1122 calls its parent. To which stack frame (of which subroutine) will point the static link in the stack frame of the called subroutine?

Enter the subroutine index, without the letter "S", e.g., for S11122, enter 11122



Answer:

 ×

The static link points always to the parent of the called subroutine, and the parent of the subroutine S112 is the subroutine S11, so the solution is 11

The correct answer is: 11

**Question 7**

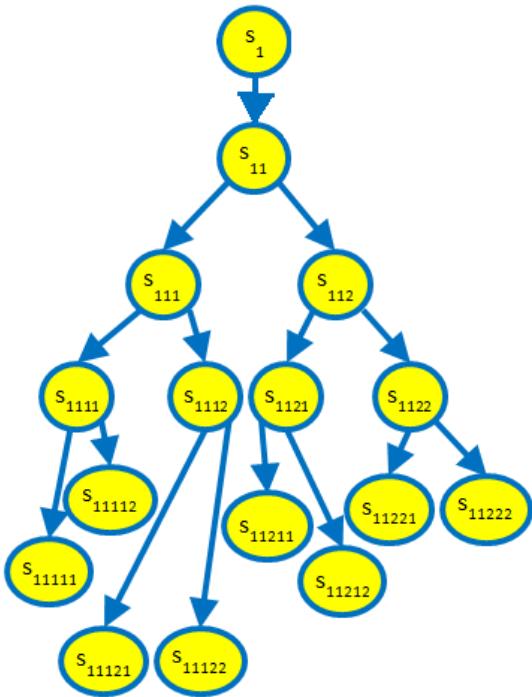
Correct

Mark 1.00 out of 1.00

The following graph shows the static nesting structure of subroutines in a particular program.

The subroutine S1121 makes a recursive call. To which stack frame (of which subroutine) will point the static link in the stack frame of the recursively called subroutine?

Enter the subroutine index, without the letter "S", e.g., for S11122, enter 11122



Answer:



The correct answer is: 112

<b>Started on</b>	Tuesday, 6 May 2025, 10:12 AM
<b>State</b>	Finished
<b>Completed on</b>	Tuesday, 6 May 2025, 10:28 AM
<b>Time taken</b>	16 mins 3 secs
<b>Marks</b>	4.00/4.00
<b>Grade</b>	0.01 out of 0.01 (100%)

**Question 1**

Correct

Mark 1.00 out of 1.00

What is the average time in the system for tasks in the batch incoming in this order, using FCFS algorithm?

task	1	2
processing time	3.4	5.3

Answer:  ✓

The first task finishes at time 3.4. The second task finishes at time  $3.4+5.3=8.7$ .

Average =  $(3.4+8.7)/2=6.05$

The correct answer is: 6,05

**Question 2**

Correct

Mark 1.00 out of 1.00

What is the average time in the system for tasks in the batch incoming in this order, using FCFS algorithm?

We have 2 processors in the system.

task	1	2	3
processing time	3.4	5.3	2.3

Answer:

4.8



For processor 1, the first task is chosen, and it finishes at time 3.4. For processor 2, the second task is chosen and it finishes at time 5.3.

When task 1 finishes, task 3 is chosen for processor 1 and it finishes at time  $3.4+2.3=5.7$ .

$$\text{Average} = (3.4+5.3+5.7)/3=4.8$$

The correct answer is: 4,8

**Question 3**

Correct

Mark 1.00 out of 1.00

What is the average time in the system for tasks in the batch incoming in this order, using SJF algorithm?

task	1	2
processing time	5.3	3.4

Answer:

6.05



The second task is shorter, so it is chosen first, and it finishes at time 3.4. The first task executes after the second and it finishes at time  $5.3+3.4=8.7$ .

$$\text{Average} = (3.4+8.7)/2=6.05$$

The correct answer is: 6,05

**Question 4**

Correct

Mark 1.00 out of 1.00

What is the average time in the system for tasks in the batch incoming in this order, using SJF algorithm?

We have 2 processors in the system.

task	1	2	3
processing time	3.4	5.3	2.3

Answer:

4.43



For processor 1, the third task is chosen because it is the shortest one, and it finishes at time 2.3. For processor 2, the first task is chosen because it is the second shortest, and it finishes at time 3.4.

When task 3 finishes, task 2 is chosen for processor 1 and it finishes at time  $2.3+5.3=7.6$ .

Average =  $(2.3+3.4+7.6)/3=4.43$

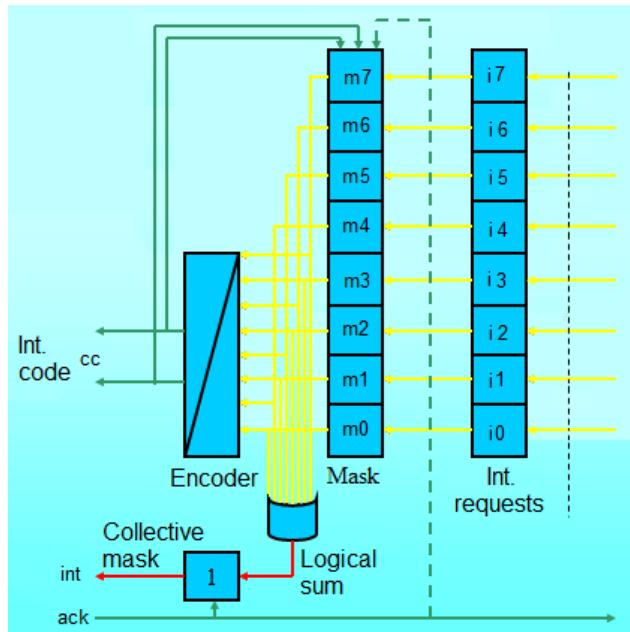
The correct answer is: 4.43

<b>Started on</b>	Tuesday, 6 May 2025, 10:15 AM
<b>State</b>	Finished
<b>Completed on</b>	Tuesday, 6 May 2025, 10:24 AM
<b>Time taken</b>	9 mins 33 secs
<b>Marks</b>	1.00/4.00
<b>Grade</b>	0.00 out of 0.01 (25%)

**Question 1**

Correct

Mark 1.00 out of 1.00



In the given interrupt controller structure, the interrupt mask is 1111100 (from m7 to m0), and interrupts 01011010 (from i7 to i0) are reported.

The interrupt with index 7 has the highest priority.

What will be the value of the interrupt code cc sent to the processor (provide a decimal value)?

If no interrupt is reported, enter -1

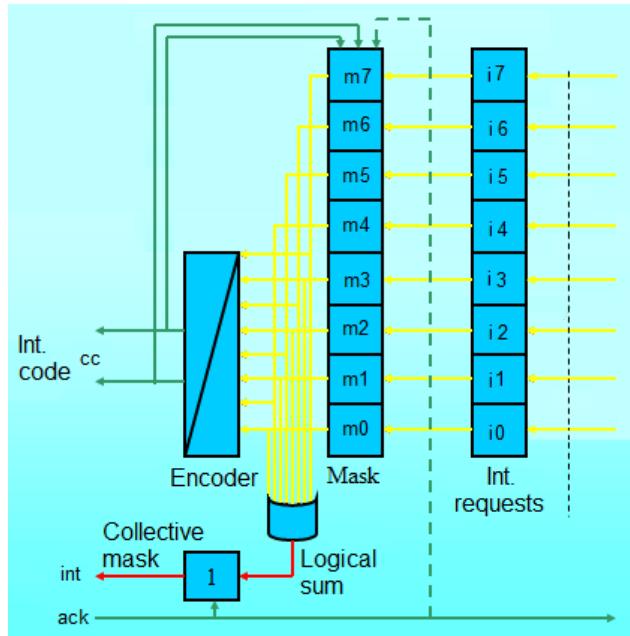
Answer:  ✓

The correct answer is: 6

**Question 2**

Incorrect

Mark 0.00 out of 1.00



In the given interrupt controller structure, the interrupt mask is 11100000 (from m7 to m0). Enter the interrupt number from 0 to 7, without the prefix "i", that caused this mask form.

The interrupt with index 7 has the highest priority.

If no interrupt could cause this mask form, enter -1.

Answer:

5

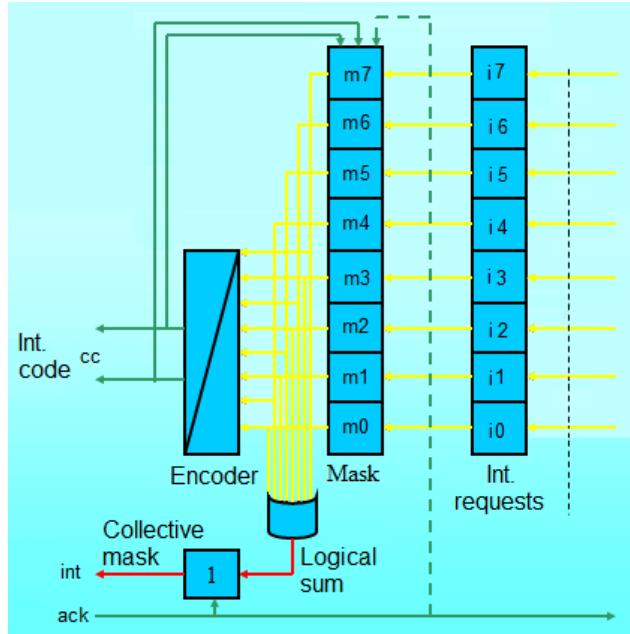


The correct answer is: 4

**Question 3**

Incorrect

Mark 0.00 out of 1.00



In the given interrupt controller structure, the interrupt mask is 11111000 (from  $m_7$  to  $m_0$ ), and interrupts 00101100 (from  $i_7$  to  $i_0$ ) are reported.

The interrupt with index 7 has the highest priority.

What will be the new value of the interrupt mask? Provide the bits  $m_7m_6m_5m_4m_3m_2m_1m_0$ , for example: 01010101

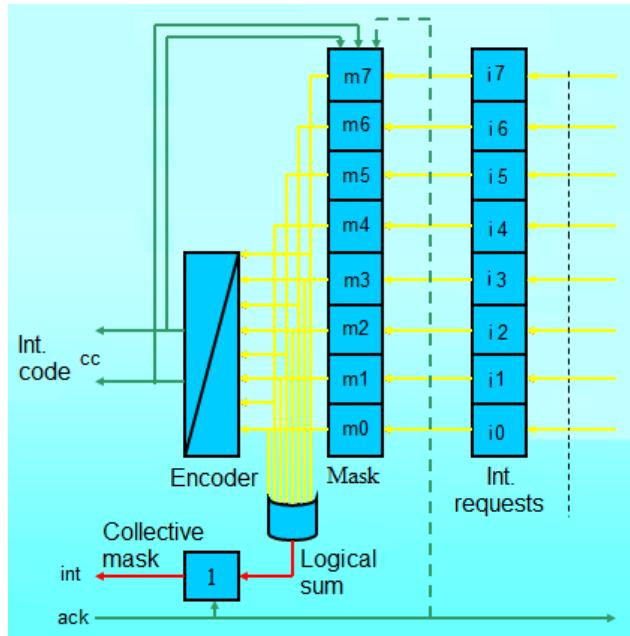
Answer:  ✖

The correct answer is: 11000000

**Question 4**

Incorrect

Mark 0.00 out of 1.00



In the given interrupt controller structure, the interrupt number cc reported to the processor is equal to 5. What will be the form of the interrupt mask (from m7 to m0) after the processor confirms the reception of this interrupt?

The interrupt with index 7 has the highest priority.

Enter the mask in the form m7m6m5m4m3m2m1m0, for example: 01010101

If this is not possible, enter -1.

Answer:  ×

The correct answer is: 11000000

<b>Started on</b>	Tuesday, 6 May 2025, 10:36 AM
<b>State</b>	Finished
<b>Completed on</b>	Tuesday, 6 May 2025, 10:53 AM
<b>Time taken</b>	17 mins 3 secs
<b>Marks</b>	6.00/22.00
<b>Grade</b>	0.00 out of 0.01 (27.27%)

**Question 1**

Correct

Mark 1.00 out of 1.00

Call parameters
Static link
Result
Trace
Dynamic link
Local variables and work fields

The stack frame is shown above. If the result is an automatic dynamic variable pointed to by the address, what memory area does the result field point to?  ✓

Twoja odpowiedź jest poprawna.

The correct answer is:

Call parameters
Static link
Result
Trace
Dynamic link
Local variables and work fields

The stack frame is shown above. If the result is an automatic dynamic variable pointed to by the address, what memory area does the result field point to? [stack]

**Question 2**

Correct

Mark 1.00 out of 1.00

Call parameters
Static link
Result
Trace
Dynamic link
Local variables and work fields

The stack frame is shown above. If the result is a dynamically managed variable pointed to by address, what memory area does the result field point to?

heap ✓

Twoja odpowiedź jest poprawna.

The correct answer is:

Call parameters
Static link
Result
Trace
Dynamic link
Local variables and work fields

The stack frame is shown above. If the result is a dynamically managed variable pointed to by address, what memory area does the result field point to? [heap]

**Question 3**

Correct

Mark 1.00 out of 1.00

Call parameters
Static link
Result
Trace
Dynamic link
Local variables and work fields

The stack frame is shown above. If the result is a dynamically allocated variable pointed to by address, what memory area does the result field point to?

heap ✓

Twoja odpowiedź jest poprawna.

The correct answer is:

Call parameters
Static link
Result
Trace
Dynamic link
Local variables and work fields

The stack frame is shown above. If the result is a dynamically allocated variable pointed to by address, what memory area does the result field point to? [heap]

**Question 4**

Correct

Mark 1.00 out of 1.00

Call parameters
Static link
Result
Trace
Dynamic link
Local variables and work fields

The stack frame is shown above. If the result is a global variable, pointed to by address, what area of memory does the result field point to?

static data



Twoja odpowiedź jest poprawna.

The correct answer is:

Call parameters
Static link
Result
Trace
Dynamic link
Local variables and work fields

The stack frame is shown above. If the result is a global variable, pointed to by address, what area of memory does the result field point to?

[static data]

**Question 5**

Correct

Mark 1.00 out of 1.00

Call parameters
Static link
Result
Trace
Dynamic link
Local variables and work fields

The stack frame is shown above. What memory area does the trace point to?



Twoja odpowiedź jest poprawna.

The correct answer is:

Call parameters
Static link
Result
Trace
Dynamic link
Local variables and work fields

The stack frame is shown above. What memory area does the trace point to? [code]

**Question 6**

Incorrect

Mark 0.00 out of 1.00

The organization of memory and processor is word-base (int also takes one 16-bit word)

variable a has the value #a0c0

top of the stack (full descending) #c100

stack frame before calling subroutine A #c105

address of subroutine A #1001

Calling rules: C convention, no static link, function result passed in registers. The stack is shown after subroutine A is called, at label point C. Subroutine A is called A(a,a,a); from address #1050.

Regardless of the programming language, subroutine A has the form:

```
A(int x,y,z);
```

```
{
```

```
    int q = x+0x20;
```

```
C: ...
```

```
}
```

Specify, in hexadecimal, what value the cell with the address #c0ff will contain.

Address	content	
#c100	????	
#c0ff		
#c0fe	#a0c0	
#c0fd	#a0c0	
#c0fc	#1051	
#c0fb	#c105	
#c0fa	#a0e0	
#c0f9	????	
#c0f8	????	

Answer: a0e0



The correct answer is: #a0c0

**Question 7**

Incorrect

Mark 0.00 out of 1.00

The organization of memory and processor is word-base (int also takes one 16-bit word)

variable a has the value #a0c0

top of the stack (full descending) #c100

stack frame before calling subroutine A #c105

address of subroutine A #1001

Calling rules: C convention, no static link, function result passed in registers. The stack is shown after subroutine A is called, at label point C. Subroutine A is called A(a,a,a); from address #1050.

Regardless of the programming language, subroutine A has the form:

```
A(int x,y,z);
```

```
{
```

```
    int q = x+0x20;
```

```
C: ...
```

```
}
```

Specify, in hexadecimal, what value the cell with the address #c0fe will contain.

Address	content	
#c100	????	
#c0ff	#a0c0	
#c0fe		
#c0fd	#a0c0	
#c0fc	#1051	
#c0fb	#c105	
#c0fa	#a0e0	
#c0f9	????	
#c0f8	????	

Answer: a0c0



The correct answer is: #a0c0

**Question 8**

Correct

Mark 1.00 out of 1.00

The organization of memory and processor is word-base (int also takes one 16-bit word)

variable a has the value #a0c0

top of the stack (full descending) #c100

stack frame before calling subroutine A #c105

address of subroutine A #1001

Calling rules: C convention, no static link, function result passed in registers. The stack is shown after subroutine A is called, at label point C. Subroutine A is called A(a,a,a); from address #1050.

Regardless of the programming language, subroutine A has the form:

```
A(int x,y,z);
```

```
{
```

```
    int q = x+0x20;
```

```
C: ...
```

```
}
```

Specify, in hexadecimal, what value the cell with the address #c0fd will contain.

Address	content	
#c100	????	
#c0ff	#a0c0	
#c0fe	#a0c0	
#c0fd		
#c0fc	#1051	
#c0fb	#c105	
#c0fa	#a0e0	
#c0f9	????	
#c0f8	????	

Answer: #a0c0 ✓

The correct answer is: #a0c0

**Question 9**

Incorrect

Mark 0.00 out of 1.00

The organization of memory and processor is word-base (int also takes one 16-bit word)

variable a has the value #a0c0

top of the stack (full descending) #c100

stack frame before calling subroutine A #c105

address of subroutine A #1001

Calling rules: C convention, no static link, function result passed in registers. The stack is shown after subroutine A is called, at label point C. Subroutine A is called A(a,a,a); from address #1050.

Regardless of the programming language, subroutine A has the form:

```
A(int x,y,z);
```

```
{
```

```
    int q = x+0x20;
```

```
    C: ...
```

```
}
```

Specify, in hexadecimal, what value the cell with the address #c0fc will contain.

Address	content	
#c100	????	
#c0ff	#a0c0	
#c0fe	#a0c0	
#c0fd	#a0c0	
#c0fc		
#c0fb	#c105	
#c0fa	#a0e0	
#c0f9	????	
#c0f8	????	

Answer: 1051



The correct answer is: #1051

**Question 10**

Incorrect

Mark 0.00 out of 1.00

The organization of memory and processor is word-base (int also takes one 16-bit word)

variable a has the value #a0c0

top of the stack (full descending) #c100

stack frame before calling subroutine A #c105

address of subroutine A #1001

Calling rules: C convention, no static link, function result passed in registers. The stack is shown after subroutine A is called, at label point C. Subroutine A is called A(a,a,a); from address #1050.

Regardless of the programming language, subroutine A has the form:

```
A(int x,y,z);
```

```
{
```

```
    int q = x+0x20;
```

```
C: ...
```

```
}
```

Specify, in hexadecimal, what value the cell with the address #c0fb will contain.

Address	content	
#c100	????	
#c0ff	#a0c0	
#c0fe	#a0c0	
#c0fd	#a0c0	
#c0fc	#1051	
#c0fb		
#c0fa	#a0e0	
#c0f9	????	
#c0f8	????	

Answer:  ×

The correct answer is: #c105

**Question 11**

Incorrect

Mark 0.00 out of 1.00

The organization of memory and processor is word-base (int also takes one 16-bit word)

variable a has the value #a0c0

top of the stack (full descending) #c100

stack frame before calling subroutine A #c105

address of subroutine A #1001

Calling rules: C convention, no static link, function result passed in registers. The stack is shown after subroutine A is called, at label point C. Subroutine A is called A(a,a,a); from address #1050.

Regardless of the programming language, subroutine A has the form:

```
A(int x,y,z);
```

```
{
```

```
    int q = x+0x20;
```

```
C: ...
```

```
}
```

Specify, in hexadecimal, what value the cell with the address #c0fa will contain.

Address	content	
#c100	????	
#c0ff	#a0c0	
#c0fe	#a0c0	
#c0fd	#a0c0	
#c0fc	#1051	
#c0fb	#c105	
#c0fa		
#c0f9	????	
#c0f8	????	

Answer: a0e0



The correct answer is: #a0e0

**Question 12**

Incorrect

Mark 0.00 out of 1.00

The organization of memory and processor is word-based (int also takes 1 word)

variable a has the value #c0a0

top of the stack (full descending) #c100

address of subroutine A #1010

Calling rules: C convention, no static link, function result passed in registers. The contents of the stack after preparing the subroutine call parameters A. Subprogram A is called A(a,a,a); from address #10a0.

Regardless of the programming language, the subroutine header A has the form:

A(int x,y,z);

Specify, in hexadecimal, what value the cell with the address #c0ff will contain.

Adres	zawartość	
#c100	????	
#c0ff		
#c0fe	#a0a0	
#c0fd	#c0a0	
#c0fc	????	
#c0fb	????	

Answer:  ×

The correct answer is: #a5a0

**Question 13**

Incorrect

Mark 0.00 out of 1.00

The organization of memory and processor is word-based (int also takes 1 word)

variable a has the value #c0a0

top of the stack (full descending) #c100

address of subroutine A #1010

Calling rules: C convention, no static link, function result passed in registers. The contents of the stack after preparing the subroutine call parameters A. Subprogram A is called A(a,a,a); from address #10a0.

Regardless of the programming language, the subroutine header A has the form:

A(int x,y,z);

Specify, in hexadecimal, what value the cell with the address #c0fe will contain.

Adres	zawartość	
#c100	????	
#c0ff	#a5a0	
#c0fe		
#c0fd	#c0a0	
#c0fc	????	
#c0fb	????	

Answer:  ×

The correct answer is: #a0a0

**Question 14**

Incorrect

Mark 0.00 out of 1.00

The organization of memory and processor is word-based (int also takes 1 word)

variable a has the value #c0a0

top of the stack (full descending) #c100

address of subroutine A #1010

Calling rules: C convention, no static link, function result passed in registers. The contents of the stack after preparing the subroutine call parameters A. Subprogram A is called A(a,a,a); from address #10a0.

Regardless of the programming language, the subroutine header A has the form:

A(int x,y,z);

Specify, in hexadecimal, what value the cell with the address #c0fd will contain.

Adres	zawartość	
#c100	????	
#c0ff	#a5a0	
#c0fe	#a0a0	
#c0fd		
#c0fc	????	
#c0fb	????	

Answer:  ×

The correct answer is: #c0a0

**Question 15**

Incorrect

Mark 0.00 out of 1.00

The organization of memory and processor is word-based (int also takes 1 word)

Variable a has a value #a0a0

Stack top (full descending) #c100

stack frame before calling the subroutine B #c01d

subroutine B address #10d1

Rules for calling: Language C convention, without a static link, the result of the function returned in the registers. The content of the stack is shown after calling the subroutine B, and then recursive by itself, at the label C. Subroutine B is called for the first time B(a); somewhere in the program from the #1cff address. The label C has #1d10 address

Regardless of the programming language, the subroutine B is in the form

B (int i);

{

    int j=i-2;

    C: B (j-1);

}

What is the value, in hexadecimal, of the cell at address #c0ff?

Address	content	
#c100	????	
#c0ff		
#c0fe	#1d00	
#c0fd	#c01d	
#c0fc	#a09e	
#c0fb	#a09d	
#c0fa	#1d11	
#c0f9	#c0fd	
#c0f8	#a09b	
#c0f7	????	

Answer:  ×

The correct answer is: #a0a0

**Question 16**

Incorrect

Mark 0.00 out of 1.00

The organization of memory and processor is word-based (int also takes 1 word)

Variable a has a value #a0a0

Stack top (full descending) #c100

stack frame before calling the subroutine B #c01d

subroutine B address #1d10

Rules for calling: Language C convention, without a static link, the result of the function returned in the registers. The content of the stack is shown after calling the subroutine B, and then recursive by itself, at the label C. Subroutine B is called for the first time B(a); somewhere in the program from the #1cff address. The label C has #1d10 address

Regardless of the programming language, the subroutine B is in the form

B (int i);

{

    int j=i-2

    C: B (j-2);

}

What is the value, in hexadecimal, of the cell at address #c0fe?

Address	content	
#c100	????	
#c0ff	#a0a0	
#c0fe		
#c0fd	#c01d	
#c0fc	#a09e	
#c0fb	#a09c	
#c0fa	#1d11	
#c0f9	#c0fd	
#c0f8	#a09a	
#c0f7	????	

Answer:  ×

The correct answer is: #1d00

**Question 17**

Incorrect

Mark 0.00 out of 1.00

The organization of memory and processor is word-based (int also takes 1 word)

Variable a has a value #a0a0

Stack top (full descending) #c100

stack frame before calling the subroutine B #c01d

subroutine B address #10d1

Rules for calling: Language C convention, without a static link, the result of the function returned in the registers. The content of the stack is shown after calling the subroutine B, and then recursive by itself, at the label C. Subroutine B is called for the first time B(a); somewhere in the program from the #1cff address. The label C has #1d10 address

Regardless of the programming language, the subroutine B is in the form

B (int i);

{

    int j=i-1;

    C: B (j-2);

}

What is the value, in hexadecimal, of the cell at address #c0fd?

Address	content	
#c100	????	
#c0ff	#a0a0	
#c0fe	#1d00	
#c0fd		
#c0fc	#a09f	
#c0fb	#a09d	
#c0fa	#1d11	
#c0f9	#c0fd	
#c0f8	#a09c	
#c0f7	????	

Answer:  ×

The correct answer is: #c01d

**Question 18**

Incorrect

Mark 0.00 out of 1.00

The organization of memory and processor is word-based (int also takes 1 word)

Variable a has a value #a0a0

Stack top (full descending) #c100

stack frame before calling the subroutine B #c01d

subroutine B address #10d1

Rules for calling: Language C convention, without a static link, the result of the function returned in the registers. The content of the stack is shown after calling the subroutine B, and then recursive by itself, at the label C. Subroutine B is called for the first time B(a); somewhere in the program from the #1cff address. The label C has #1d10 address

Regardless of the programming language, the subroutine B is in the form

B (int i);

{

    int j=i-2;

    C: B (j-2);

}

What is the value, in hexadecimal, of the cell at address #c0fc?

Address	content	
#c100	????	
#c0ff	#a0a0	
#c0fe	#1d00	
#c0fd	#c01d	
#c0fc		
#c0fb	#a09c	
#c0fa	#1d11	
#c0f9	#c0fd	
#c0f8	#a09a	
#c0f7	????	

Answer: a09f



The correct answer is: #a09e

**Question 19**

Incorrect

Mark 0.00 out of 1.00

The organization of memory and processor is word-based (int also takes 1 word)

Variable a has a value #a0a0

Stack top (full descending) #c100

stack frame before calling the subroutine B #c01d

subroutine B address #10d1

Rules for calling: Language C convention, without a static link, the result of the function returned in the registers. The content of the stack is shown after calling the subroutine B, and then recursive by itself, at the label C. Subroutine B is called for the first time B(a); somewhere in the program from the #1cff address. The label C has #1d10 address

Regardless of the programming language, the subroutine B is in the form

B (int i);

{

    int j=i-1;

    C: B (j-2);

}

What is the value, in hexadecimal, of the cell at address #c0fb?

Address	content	
#c100	????	
#c0ff	#a0a0	
#c0fe	#1d00	
#c0fd	#c01d	
#c0fc	#a09f	
#c0fb		
#c0fa	#1d11	
#c0f9	#c0fd	
#c0f8	#a09c	
#c0f7	????	

Answer:  ×

The correct answer is: #a09d

**Question 20**

Incorrect

Mark 0.00 out of 1.00

The organization of memory and processor is word-based (int also takes 1 word)

Variable a has a value #a0a0

Stack top (full descending) #c100

stack frame before calling the subroutine B #c01d

subroutine B address #10d1

Rules for calling: Language C convention, without a static link, the result of the function returned in the registers. The content of the stack is shown after calling the subroutine B, and then recursive by itself, at the label C. Subroutine B is called for the first time B(a); somewhere in the program from the #1cff address. The label C has #1d10 address

Regardless of the programming language, the subroutine B is in the form

B (int i);

{

    int j=i-2;

    C: B (j);

}

What is the value, in hexadecimal, of the cell at address #c0fa?

Address	content	
#c100	????	
#c0ff	#a0a0	
#c0fe	#1d00	
#c0fd	#c01d	
#c0fc	#a09e	
#c0fb	#a09e	
#c0fa		
#c0f9	#c0fd	
#c0f8	#a09c	
#c0f7	????	

Answer:  ×

The correct answer is: #1d11

**Question 21**

Incorrect

Mark 0.00 out of 1.00

The organization of memory and processor is word-based (int also takes 1 word)

Variable a has a value #a0a0

Stack top (full descending) #c100

stack frame before calling the subroutine B #c01d

subroutine B address #10d1

Rules for calling: Language C convention, without a static link, the result of the function returned in the registers. The content of the stack is shown after calling the subroutine B, and then recursive by itself, at the label C. Subroutine B is called for the first time B(a); somewhere in the program from the #1cff address. The label C has #1d10 address

Regardless of the programming language, the subroutine B is in the form

B (int i);

{

    int j=i-1;

    C: B (j-1);

}

What is the value, in hexadecimal, of the cell at address #c0f9?

Address	content	
#c100	????	
#c0ff	#a0a0	
#c0fe	#1d00	
#c0fd	#c01d	
#c0fc	#a09f	
#c0fb	#a09e	
#c0fa	#1d11	
#c0f9		
#c0f8	#a09d	
#c0f7	????	

Answer: c0fd



The correct answer is: #c0fd

**Question 22**

Incorrect

Mark 0.00 out of 1.00

The organization of memory and processor is word-based (int also takes 1 word)

Variable a has a value #a0a0

Stack top (full descending) #c100

stack frame before calling the subroutine B #c01d

subroutine B address #10d1

Rules for calling: Language C convention, without a static link, the result of the function returned in the registers. The content of the stack is shown after calling the subroutine B, and then recursive by itself, at the label C. Subroutine B is called for the first time B(a); somewhere in the program from the #1cff address. The label C has #1d10 address

Regardless of the programming language, the subroutine B is in the form

B (int i);

{

    int j=i-3;

    C: B (j-2);

}

What is the value, in hexadecimal, of the cell at address #c0f8?

Address	content	
#c100	????	
#c0ff	#a0a0	
#c0fe	#1d00	
#c0fd	#c01d	
#c0fc	#a09d	
#c0fb	#a09b	
#c0fa	#1d11	
#c0f9	#c0fd	
#c0f8		
#c0f7	????	

Answer:  ×

The correct answer is: #a098

**1.**The system stack must provide space for:

- Processor registers in as many copies as there are interrupt lines +1

**2.**Twice consecutive execution in one process of operation P on a raised binary semaphore:

- Causes the semaphore to get down
- If a semaphore guards a critical region, it leads to a deadlock

**3.**In UNIX, access rights are attributes:

- An entry in the I-node table

**4.**The kernel (microkernel) is responsible for:

- interrupt handling (at the elementary level, then they are passed on to other layers)
- synchronization of processes and devices with processes
- task control

**5.**In multi-level interrupts (vectored interrupts) the jump is performed:

- according to the table indexed by the interrupt number

**6.**In UNIX, the disk contains the following areas:

- Files data
- I-node table
- SuperBlock

**7.**What is this technique where the operating system gathers programs and data together before processing?

- Batch processing

**8.**The page fault interrupt is used to:

- Downloads to the memory of the requested page

**9.**Scheduling algorithms can be:

- Indulgent
- Preemptive

**10.** The resources of the computer system are:

- Primary memory
- Peripheral devices
- Processor time

**11.** When is the scheduler called?

- at the end of the execution of each kernel procedure

**12.** A memory management technique in which the system divides memory into equal-sized portions to easily manage relocation is called:

- paging

**13.** What does the file system layer do?

- Manages files
- Manages directories
- Manages free storage space
- Tracks the status of information

**14.** Indulgent scheduling is the best mechanism for:

- real-time system

**15.** What does the kernel do when there is no task (process) to run?

- Starts the idle task

**16.** Discontinuous allocation is the result of:

- segmentation
- paging

**17.** Paging is in thrashing if:

- the system spends more time paging than execution
- 18.** The return from interrupt instruction:
- restores the conditions register
  - restores the program counter
- 19.** Dynamic relocation requires the use of:
- Base register (DATUM)
- 20.** A program compiled for execution in paged memory can be executed in regular memory.  
False
- 21.** Page thrashing is a phenomenon involving:
- frequent downloading of pages that have just been swapped out from memory
  - Frequent loading of pages that have just been ejected from memory
- 22.** Semaphores are used to solve the problem:
- Mutual exclusion
- 23.** Dirty frame is:
- modified
- 24.** The common allocation queue to fixed blocks of memory of equal size causes:
- Internal fragmentation
- 25.** Which scheduler needs to make a decision the fastest?
- short-term
- 26.** In operating system:
- Every exception must be handled
- 27.** Static relocation is performed by:
- compiler
  - linker
  - Loader
- 28.** Operation V on a raised binary semaphore:
- It does not change the value of the semaphore
- 29.** Fragmentation is implied by:
- Internal by paging
  - Internal by partitioning into quantized blocks
  - External by freeing blocks in a deallocation order not reverse to allocation
  - External by resizing allocated blocks
- 30.** A process can appear in the pool of scheduling processes as a result of:
- Performing V operation on the semaphore
  - Completing an I/O operation
  - Starting a new process
- 31.** External fragmentation can be avoided by:
- Allocation of fixed size static memory blocks
  - Freeing memory blocks in the reverse order to allocation
- 32.** The Test-And-Set or Compare-And-Swap instruction has the following characteristics:
- Requires active waiting from tasks
  - It is possible to use only on computers with common memory
  - It is possible to deadlock with TAS/CAS operations on multiple variables
- 33.** Address translation is handled by a unit called (give the abbreviation):
- MMU
- 34.** Dynamic relocation:
- Requires hardware support in the form of a DATUM register

- Allows for temporal elimination of external fragmentation

**35.** Opening a file in UNIX writes the following entries in the operating system's data structures:

- Inserting a new entry into the Table of Active I-nodes or increasing the counter in an existing entry
- Inserting a new item into the Table of Open Files of the Process

**36.** What type of code can multiple processes execute simultaneously?

- reentrant

**37.** Address translation aims to:

- Converting a virtual address to a physical one

**38.** The optimal scheduling algorithm in terms of minimizing the average time in the system of a given task is:

- SJF

**39.** Inter-process communication can be organized using:

- messages
- shared directly addressable memory fields
- shared memory fields accessible through system calls

**40.** For concurrency in OS:

- Interrupt handling is necessary

**41.** Which of the following information is stored on task switching?

- I/O status information
- scheduler data
- contents of general purpose registers, program counter, and similar registers available to the program
- Contents of datum, limit and other registers inaccessible to the program

**42.** The conversion of the effective address to the physical one takes place:

- In the memory management unit

**43.** Which of the following statements is true for system level threads?

- Kernel-level threads require their descriptors in the kernel

**44.** Address translation mechanism:

- Concatenates the frame number and offset on the page

**45.** Dynamic relocation is performed by:

- Paging system
- Special registers (DATUM)
- Segment descriptors

**46.** What is included in the context that must be maintained for a synchronous precision interrupt?

- general purpose registers
- program counter
- collective or individual interrupt mask

**47.** System/user threads:

- User-level thread descriptors are stored in the address space of the program
- User-level threads share the same execution context
- System level thread descriptors are stored in the operating system kernel

**48.** How is exception identification performed?

- the specification of hardware interrupts is given over the data bus

**49.** The combination of paging and segmentation consists in:

- the use of a segment table or a pool of segment registers treated as an additional, superior level of paging

- 50.** The behavior of the exchange algorithm opposite to that expected with the measures taken is called:
- anomaly
- 51.** The hardware resources of a computer system are:
- Processor time
  - Primary memory
  - Peripheral devices
- 52.** How does the operating system call the task completion subroutine?
1. → builds the frame of the terminating subroutine on the task stack
  2. → sets the trace in the terminating subroutine to the current position
  3. → builds an interrupt vector on the system stack pointing to the terminating subroutine code
  4. → recreates the context programmatically and executes the IRET instruction
- 53.** What mechanism is part of time-sharing systems?
- short-term scheduler
  - low-level scheduler
- 54.** On UNIX, the number of files is directly limited by:
- I-node table size
  - The size of the space allocated for files
- 55.** What are the functions of the kernel?
- Interrupt handling
- 56.** What type of code can be executed simultaneously on multiple processors?
- reentrant
- 57.** MMU uses index tables to:
- generating a physical address
  - generate a physical address
- 58.** To end the interrupt service, use the following instruction:
- Special return instruction
- 59.** Physical address:
- points to a location in the address space of primary memory
- 60.** Threads in operating system:
- They share context except registers and stack
- 61.** The page fault exception is specific in that:
- is reported in the "middle" of an instruction execution
  - execution of the instruction may require decrementing the program counter
  - continuation of the instruction execution may require the saving of internal processor registers storing intermediate values
- 62.** Virtual memory consists of:
- Primary memory and storage memory
  - primary and mass memory
- 63.** The scheduling goal, which is to occupy processors as efficiently as possible, is:
- utilization
- 64.** The use of timer interrupts is necessary:
- In multiuser systems
  - At the suspended state is a process that:
  - Waits for an I/O operation to complete
- 65.** Which of the following memory allocation schemes causes external fragmentation?

- Segmentation
  - Sweeping
  - Multiple contiguous fixed partitions of various sizes
66. Which of the following interrupts a running process?
- Hardware interrupt
  - Timer interrupts
  - Power fail interrupt
67. Conditional variables in a monitor:
- They are used to suspend processes that cannot run because the conditions for their continuation are not met
68. In a FAT-based disk system (without sharing allocation units by files), the number of files is directly limited by:
- FAT table size
  - The size of the disk space
69. In a FAT-based disk system, file size is directly limited by:
- The size of the disk space
  - The number of bits of the field describing the size of the file
70. The scheduler decisions take the form:
- change from ready to active state
71. Interrupt vector is saved in a case of:
- accepting a hardware interrupt
  - accepting a non-maskable interrupt
  - jump with trace
72. Allocation unit for file storage:
- must be constant across the disk partition
  - may vary between partitions
73. Allocation unit for storing files:
- must be constant across the disk partition
  - may vary between partitions
74. FIRST-FIT algorithm:
- Causes external fragmentation
75. Processor access scheduling decisions may be made under which of the following circumstances?
- When a task goes from the active state to the waiting state
  - When a task transitions from the active state to the ready state
  - When a task goes from the waiting state to the ready state
  - When a task terminates
76. The following situations cause the exceptions (processor internal interrupts) of the "error" type:
- a reference to memory that is not in the address space
  - memory reference beyond limit register value
  - an attempt to write to the page for which the "read only" bit is set
77. Multiprogram systems:
- It holds more than one program in primary memory at the same time
78. The direct resume rule means that:
- The resuming process loses the critical region
  - The resuming process applies for the critical region just like other processes on monitor input

- The resuming process applies for the critical region just like other processes waiting to enter the critical region

**79.** What is true for simultaneous execution in the same context?

- Threads minimize context switch time
- The use of threads ensures concurrency within the process
- A multiprocessor kernel can be concurrent

**80.** The following situations trigger "error" exceptions:

- attempting to execute an illegal instruction
- attempting to execute in user mode an instruction that is only legal in system mode
- a reference to memory that is not in the program address space
- memory reference beyond limit register value
- an attempt to execute an instruction from the area of the page for which the "no code" bit was set

**81.** When an exception is raised in user mode, the operating system switches to the kernel system stack, and what happens when an exception is raised in system mode?

- nothing special, it builds the context on the kernel system stack

**82.** The number of condition variables is by definition in the monitor:

- as many as there are different conditions for the continuation of processes

**83.** What mechanism is used to desynchronize processes with different relative speeds?

- buffer

**84.** Is IOW bit:

- Protection bit

**85.** Sequence of actions when starting a new task:

1. filling in the descriptor in the kernel
2. memory allocation if this is the first task of the program
3. initialize the stack, fill the first frame
4. instruction to transfer control to the task

**86.** A multiprogram system is one that, in principle:

- It allows for storing many programs in primary memory
- It allows for storing many programs in the main memory
- Requires relocation or equivalent mechanism

**87.** A single-program system is one that, in principle:

- Allows for storing only one program in primary memory

**88.** The common allocation queue to fixed blocks of memory of different sizes causes:

- internal fragmentation
- external fragmentation

**89.** If the compiler prepares a program with absolute addresses to be loaded in a fixed address space, it is called:

- Static relocation

**90.** During the interrupt handling:

- other interrupts may or may not be accepted at the discretion of the programmer

**91.** Scheduling aims to optimize:

- processor utilization
- system throughput
- wait time
- reaction time

**92.** The page index table address is stored in:

- page table base register
- 93.** Page Index Table address is kept in:
- page table base register
- 94.** The file system layer plays the following role in the operating system:
- Performs file opening and closing operations
  - It performs directory services in the hierarchy of disk files
  - Controls file access rights
- 95.** The algorithm in which the most recently loaded page is swapped out is called (enter the abbreviation if applicable):
- FIFO
- 96.** The algorithm in which the most recently used page is swapped out is called (enter the abbreviation if applicable):
- LRU
- 97.** In which swapping algorithms is the M bit value used?
- NRU
- 98.** Using Test-And-Set or Compare-And-Swap in synchronization:
- It requires processes to actively wait
  - It can only be applied in systems with shared memory
- 99.** Using the Test-And-Set instruction in synchronization:
- It requires processes to actively wait
- 100.** Memory partitioning into blocks of any size:
- It does not imply fragmentation
- 101.** What can happen when a job leaves the critical section and more than 1 task is waiting for the critical section?
- starvation awaiting a critical section
- 102.** The root directory of the disk should be located:
- in a place designated by the data structure in a fixed location on the disk
- 103.** Which technique was introduced because a single task could occupy both the CPU and I/O devices?
- Interrupts
- 104.** Individual interrupt mask:
- a register whose bits are ANDed (conjunction) with the bits from the interrupt request register
- 105.** Which swapping algorithms use the current time slice number?
- Second chance
  - Working set
- 106.** Paging-two-level index tables mode of operation
- The content of a level 1 table element points to a level 2 table
- 107.** What is a scheduler?
- a kernel routine that selects a task to execute
- 108.** In indulgent scheduling, the process keeps the CPU until:
- waiving
  - termination
- 109.** With indulgent scheduling, once a CPU is allocated to a task, the task keeps it until:
- releasing the processor by the task
  - task termination
- 110.** Two successive executions of operation V in one process on a binary semaphore in down state:
- If the semaphore guards a critical region, it can let two processes enter the critical region

- Raises the semaphore if there are no suspended processes

**111.** The operating system plays the following role in a computer system:

- Create a concurrent environment
- computer system resource management
- creating abstraction (virtualization) of hardware

**112.** What mechanism is used to save and restore the task state?

- Context switch

**113.** What mechanism is used to preserve the states of preempted tasks?

- Context switch

**114.** Internal fragmentation consists in:

- The program does not use all the memory allocated to it

**115.** The following paging exceptions allow for returning to the program after they occur:

- page fault
- interrupt on write (IOW)

**116.** For address translation, the following is used:

- index table
- associative translation buffer

**117.** In UNIX, access rights are specified:

- Individually for each file
- Separately for the user, the group to which the user belongs and for all others
- Separately for write, read and execute/search

**118.** Calling the program with the "exec" operation results in (accurately to the result of the exec operation):

- Loading code and data segments from disk, initializing a new stack segment

**119.** Scheduler function is:

- selecting a task to run

**120.** In the philosophers problem, if there are 4 of them:

- Deadlock is possible
- Starvation is not possible

**121.** The software resources of a computer system are:

- Files
- Buffers
- Semaphores

**122.** Can the exchange algorithm: selecting a frame to empty and loading a new page, be performed in user mode?

- True

**123.** Interrupt mask:

- causes interrupts to be disabled when an interrupt is accepted
- can unblock interrupts when the interrupt handler completes
- can be set and reset by special processor instructions

**124.** Which swapping algorithms use page reference history?

- LRU
- LFU

**125.** The thread is also called:

- Lightweight process

**126.** Round-robin scheduling is the best mechanism for:

- time-sharing system

- 127.** Priority scheduling is the best mechanism for:
- system with many process classes
- 128.** Context switch is:
- writing registers to the task stack and retrieving them from another task stack
- 129.** Separate allocation queues for fixed memory blocks of equal size cause:
- internal fragmentation
  - external fragmentation
- 130.** A multiuser system is one that, in principle:
- Must be concurrent
  - Requires the use of timer interrupts
- 131.** In which swapping algorithms is it necessary to collectively clear the M-bits?
- No algorithm
  - NRU (? w pdf jest inaczej niż w docx)
- 132.** Interrupt request register is:
- a register where interrupt line states are stored
- 133.** The internal state of the file system layer is available for:
- OS kernel
  - Program supervisor layer
- 134.** "Soft" real-time system:
- Guarantees average response time
- 135.** The key in associative memory is:
- Page number
- 136.** The sweeping mechanism consists in:
- Loading segments into primary memory and sending them to disk
- 137.** The interrupt acceptance sequence consists of (in the sequence):
- identification of the interrupt level, saving the interrupt vector, performing a jump with a trace according to the interrupt table
- 138.** Imprecise interrupts can be handled:
- after clearing the pipeline from the instructions
  - after saving the full state of the pipeline
- 139.** Logical address:
- points to a cell in the process address space
  - is converted to a physical address in the address translation mechanism
- 140.** Imprecise interrupts are:
- accepted in any state of the processor, not just between the execution of successive instructions
- 141.** Precise interrupts are:
- accepted only in a stable state between the execution of successive instructions
- 142.** Internal fragmentation can be removed by:
- No response from the others
- 143.** The mechanism for moving programs between primary memory and mass storage is called:
- sweeping
- 144.** Semaphore function is to:
- Synchronize critical resources to prevent a deadlock
- 145.** Between fork and exec operations, the following operations are performed:
- Opening the appropriate input/output files
- 146.** The sweeping criteria include:
- Priority

- Program state
- Analysis of program execution history

**147.** The number of tasks performed on the system in a given time is:

- throughput

**148.** By definition, a deadlock is a situation where:

- any greater than zero number of processes are waiting for conditions that cannot be met

**149.** SJF selects the task:

- with the least CPU requirement

**150.** Which swapping algorithms use the history of page references (when was it last used or in which time slices was it used)?

- second chance
- LRU
- LFU
- working set

**151.** The page reference and modification bits are used to:

- counting references for swapping optimization
- counting references for optimize exchanges

**152.** When the processor is released, the scheduler selects one of the queued processes:

- ready

**153.** The page error (page fault) interrupt is used to:

- download the requested page to the primary memory

**154.** Logical address is:

- effective address

**155.** The logical address is also:

- Effective address

**156.** In what states can a task occur?

- current
- ready
- blocked

**157.** The effective address is at the same time:

- logical address

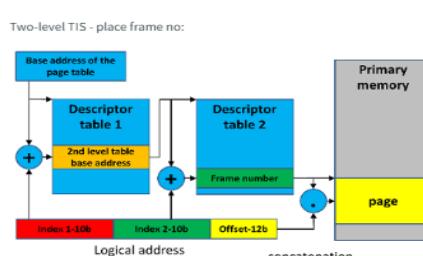
**158.** The effective address is also:

- Logical address

**159.** The content of the last (lowest in the hierarchy) page index table is:

- frame

**160.** Two-level TIS - place frame no:



- in the table of the second level - on the right in the figure

**161.** The environment in which the process is executed includes:

- A set of environment variables

- Process address space

- General purpose registers content

- Open files

**162.** Which of the following applies to user-level threads?

- User-level threads cost no execution time in system mode

**163.** WORST-FIT algorithm:

- Requires a descending sort of the list of free blocks

- It allows for fast determining whether there is a free block of the required size

- It is designed to reduce external fragmentation

- Requires sorting the cut part into the list of free blocks

**164.** The hardware mechanisms necessary for paging are ("frame error" also called "page fault", "frame miss"):

- address translation, page index tables, "frame error" interrupt

**165.** Having two-level page index tables:

- the content of a level I table element points to a level II table

**166.** Which swapping algorithms use information about a reference to pages in the last k periods of time?

- working set

- working set clock

**167.** When a suspended program is moved to auxiliary memory, its process state is called:

- Swept away

**168.** Which of the following facilities or abilities are required to provide mutual exclusion support?

- A task that is performed outside the critical section must not affect the behavior of a task in the critical section.

- The task stays in its critical section only for a finite amount of time

**169.** If a linker prepares a program with absolute addresses to be loaded in a fixed address space, it is called:

- Static relocation

**170.** At the blocked state is a process that:

- waits for an I/O operation to complete

**171.** Collective interrupt mask is:

- a register that blocks or unblocks all interrupts

**172.** Which swapping algorithms can be implemented based on hardware support in the form of a collective reading of reference bits and collective clearing of these bits?

- LRU

- LFU

**173.** In a multitasking environment, the operating system decides which task the CPU gets, when, and for how long. This feature is called:

- Task scheduling

**174.** Is memory protection useless in a non-concurrent system?

- False

**175.** The program supervisor layer in the operating system has the following role:

- Intercepts all program system calls and routes them to the appropriate layers

- Runs programs

- Deals with the management of primary memory (memory allocation to programs)

**176.** A process always transitions from the "user" state to the "system" state as a result of:

- A software interrupt that calls a system function

- Debugger trap
- 177.** At the ready state is a process that:
- Waits for a processor
- 178.** The kernel is \_\_\_\_\_ user-level threads.
- unaware
- 179.** After performing the mount(/dev/hd5,/usr/x/bin/hd5) operation, the file /usr/z/a on the mounted disk should be referenced by:
- /usr/x/bin/hd5/usr/z/a
- 180.** In a concurrent environment, the operating system decides which task the CPU gets, when, and for how long. This feature is called:
- Task scheduling
- 181.** There are three processes in the system:  
C - calculation process (batch process performing complex calculations lasting several hours),  
T - text editor (user edits text document)  
K - compiler (the user compiles the program, e.g. in C++).
- Assign processes to priorities in the operating system from the highest to the lowest priority.
- highest [T]
  - intermediate [K]
  - lowest [C]
- 182.** In which swapping algorithms is it necessary to clear the M bits individually?
- No algorithm
- 183.** In round-robin scheduling, if each task is allotted a certain amount of time to execute, it is called:
- Time slice
- 184.** The program must be specially compiled to run in paged memory.
- false
- 185.** Interrupt vector:
- it is saved automatically when an interrupt is accepted
  - contains minimal information that cannot be saved programmatically
- 186.** Paging - the key in associative memory is:
- Page number
- 187.** Frame protection bits:
- Must be available for writing
- 188.** The multi-level interrupt controller includes:
- Collective interrupt mask
  - Interrupt request register
  - Individual interrupt mask
  - Priority encoder
- 189.** Compaction solves the problem:
- External fragmentation
- 190.** Converting the effective address to physical is performed in:
- memory management unit
- 191.** The microkernel of the operating system performs the following role:
- Synchronizes processes
  - It receives interrupts and routes them to the appropriate drivers and other layers of the system

**192.** Consider the following sequence of address references:

123, 215, 600, 1234, 76, 96.

If the page size is 100, the order of page references is as follows:

- 1,2,6,12,0,0

(simply divide by 100, discard remainders, if 0.87 or sth, it is 0)

**193.** Multiprogramming is a technique in which, as a rule:

- many programs can be stored in primary memory

**194.** What is included in the context that must be saved for a synchronous (inter-instruction) precision interrupt?

- collective of individual interrupt mask
- general purpose registers
- program counter

**195.** General semaphore:

- is to perform only indivisible operations
- is a shared variable
- can be only non-negative

**196.** What is true about system level threads?

- All process threads share the same address space.
- All process threads can share the same set of open files.
- All process threads can share the same set of child processes.

**197.** In the case of hardware interrupt summation ("wire or"):

- the processor can programmatically poll devices about issuing an interrupt
- the bus driver can poll devices about issuing an interrupt

**198.** Multi-threading on a multi-processor machine:

- increases concurrency

**199.** Essential activity in the interrupt handling procedure (i.e., the activity for which the interrupt is issued) consists in:

- unlocking the process waiting for this interrupt

**200.** Which task queue can never be empty?

- running tasks

**201.** The process context includes:

- General purpose registers
- Process descriptor (? – question 79 & 59)
- Code and data

**202.** When starting a program, how is control passed to it from the operating system?

- return from interrupt handler IRET

**203.** Which of the following statements applies to the process?

- A process is defined as a set of resources needed to run a program.
- The execution of the process must proceed in a sequential manner.
- A process is a running program.

**204.** The purpose of mutual exclusion is:

- obtaining exclusive access

**205.** Inter-process communication can be organized using:

- shared memory fields accessible through system calls
- shared directly addressable memory fields
- messages

- 206.** What does it mean that the interrupt subsystem is vectored (all components of the correct answer must be given)?
- interrupts are accepted on multiple input lines
  - there is an interrupt handling table indexed by the interrupt line number
  - there is an individual interrupt mask
- 207.** The interrupt encoder is:
- a combinational circuit that computes the number of the reported and unmasked interrupt with the highest priority
  - a combinational circuit that calculates the value of a new individual interrupt mask
  - a combinational circuit that transmits to the processor the number of the interrupt to be serviced
- 208.** Which scheduling is used to organize concurrency?
- short-term
- 209.** What mechanism is part of batch systems?
- medium-term scheduler
  - long-term scheduler
- 210.** What are the sequence of actions in interrupt handling?
1. saving a copy of the interrupt vector (PC and SR)
  2. switching to system mode (modification of PC and status register)
  3. programmatic context saving
  4. switching to the system stack
- 211.** After accepting an interrupt, the next interrupts are:
- blocked
- 212.** Which scheduler is also called a job planner?
- long-term
- 213.** What exception (software or hardware interrupt) causes system mode if user mode is current?
- any exception
- 214.** In a multiprocessor operating system, interrupt blocking is sufficient to prevent the microkernel from executing its routines simultaneously.
- False
- 215.** The difference between trap and error is:
- errors are generally reported asynchronously and traps synchronously
  - after an error, there is usually no return to the program, and after a trap, yes
- 216.** In the "current" state, there is a process that:
- occupies a processor
- 217.** Devices report their readiness by:
- issuing an interrupt
  - setting a status bit
- 218.** Context switch is caused by:
- Interrupts
- 219.** The result of cooperation of concurrent processes:
- it can be non-deterministic
  - it may depend on how processes are scheduled
- 220.** The following situations cause "error" exceptions (processor internal interrupts):
- illegal instruction
  - instruction legal but prohibited in user mode

**221.** Cloning a process with a fork operation results in (not taking to account the numerical result of fork ):  
- Duplication of data segment and stack segment

**222.** The interrupt vector consists of:

- program counter
- status register
- condition bits

**223.** Which mechanisms are supported by the phenomenon of locality of references?

- page swapping
- multilevel page index tables
- reverse page index tables
- associative memory of page references

**224.** Scheduling disc access involves deciding on the following:

- The order in which disc access requests should be handled

**225.** A typical collection of program segments includes (some of them can be combined):

- Code segment
- Data segment
- Stack segment

**226.** The relocating loader generates addresses as the program is loaded into primary memory.

These addresses are:

- Absolute

Rozpoczęto	sobota, 14 czerwca 2025, 12:57
Stan	Ukończone
Ukończono	sobota, 14 czerwca 2025, 13:08
Wykorzystany czas	10 min. 53 sek.
Punkty	9,00/40,00
Ocena	6,08 pkt. na 27,00 pkt. możliwych do uzyskania (22,5%)

**Pytanie 1**

Poprawnie

Punkty: 1,00 z 1,00

W skład środowiska w którym jest realizowany proces wchodzą:

Wybierz wszystkie poprawne:

- a. Zbiór zmiennych środowiska ✓
- b. Przestrzeń adresowa procesu ✓
- c. Zawartość rejestru zgłoszeń przerwań
- d. Zawartość w jednostki zarządzania pamięcią
- e. Zawartość rejestrów ✓
- f. Otwarte pliki ✓

Twoja odpowiedź jest poprawna.

Prawidłowymi odpowiedziami są: Zbiór zmiennych środowiska, Przestrzeń adresowa procesu, Zawartość rejestrów, Otwarte pliki

**Pytanie 2**

Poprawnie

Punkty: 1,00 z 1,00

W skład środowiska w którym jest realizowany proces wchodzą:

Wybierz wszystkie poprawne:

- a. Przestrzeń adresowa procesu ✓
- b. Zawartość rejestru zgłoszeń przerwań
- c. Zbiór zmiennych środowiska ✓
- d. Zawartość rejestrów uniwersalnych ✓

Twoja odpowiedź jest poprawna.

Prawidłowymi odpowiedziami są: Zbiór zmiennych środowiska, Przestrzeń adresowa procesu, Zawartość rejestrów uniwersalnych

**Pytanie 3**

Niepoprawnie

Punkty: 0,00 z 1,00

Algorytm, w którym jest wyrzucana strona najdawniej załadowana, nazywa się (podaj skrót jeżeli jest dla tego algorytmu używany):

Odpowiedź: LRU



Poprawna odpowiedź to: FIFO

**Pytanie 4**

Niepoprawnie

Punkty: 0,00 z 1,00

System czasu rzeczywistego „twardy”:

Wybierz wszystkie poprawne:

- a. Gwarantuje czas obsługi przerwania ✗
- b. Gwarantuje średni czas reakcji
- c. Gwarantuje czas reakcji

Twoja odpowiedź jest niepoprawna.

Poprawna odpowiedź to: Gwarantuje czas reakcji

**Pytanie 5**

Niepoprawnie

Punkty: 0,00 z 1,00

Który z poniższych schematów alokacji pamięci może podlegać zewnętrznej fragmentacji?

- a. Wiele ciągłych stałych partycji o jednakowym rozmiarze
- b. Wiele ciągłych stałych partycji o różnej wielkości ✓
- c. Stronicowanie ✗
- d. Segmentacja

Prawidłowymi odpowiedziami są: Segmentacja, Wiele ciągłych stałych partycji o różnej wielkości

**Pytanie 6**

Niepoprawnie

Punkty: 0,00 z 1,00

W których algorytmach wymiany jest używana historia dostępów do strony?

Wybierz wszystkie poprawne:

a. zegarowy zbioru roboczego

b. LFU

c. drugiej szansy ✗

d. LRU

e. NRU ✗

f. zbioru roboczego

g. FIFO

Twoja odpowiedź jest niepoprawna.

Prawidłowymi odpowiedziami są: LRU, LFU

**Pytanie 7**

Poprawnie

Punkty: 1,00 z 1,00

przerwanie „błąd strony” (page fault) jest zgłasiane gdy:

Wybierz wszystkie poprawne:

a. na bieżącej stronie wystąpił błąd

b. program wykonuje dostęp do strony której nie ma w pamięci operacyjnej ✓

c. program wykonuje dostęp do strony której nie ma w kieszeni (pamięci podręcznej)

d. program wykonuje dostęp do strony

Twoja odpowiedź jest poprawna.

Poprawna odpowiedź to: program wykonuje dostęp do strony której nie ma w pamięci operacyjnej

**Pytanie 8**

Nie udzielono odpowiedzi

Punkty maks.: 3,00

ramka	M	R	należy do procesu	1-używana, 0-nie
1	1	0	0	0
2	0	0	2	0
3	1	1	1	1
4	0	1	0	0
5	1	0	3	1
6	1	0	1	1
7	0	0	2	0
8	1	1	1	0

Używając powyższej tabeli, z lokalną regułą przydziału ramek, która ramka zostanie przydzielona do procesu? Strony są skanowane zaczynając od góry. Proces, dla którego ramka jest potrzebna to 2. Podaj numer ramki.

Odpowiedź:  ×

Poprawna odpowiedź to: 2

**Pytanie 9**

Nie udzielono odpowiedzi

Punkty maks.: 3,00

W przypadku metody SCAN szeregowania operacji dyskowych, aktualnie wykonywana operacja dotyczy cylindra 30. Bieżący kierunek w metodzie SCAN jest rosnący. Następne zaplanowane operacje (w kolejności ich kolejkowania) to:

Numer operacji	1	2	3	4	5
Numer cylindra	41	24	25	34	40

Dla następnej operacji dyskowej podaj odległość ruchu głowicy (w cylindrach) między bieżącą a następną operacją.

Odpowiedź:  ×

Poprawna odpowiedź to: 4

**Pytanie 10**

Nie udzielono odpowiedzi

Punkty maks.: 3,00

Przy otwarciu pliku podajemy tryb otwarcia i tryb współdzielenia.

Zakodujmy kody otwarcia:

fmOpenRead	10
fmOpenWrite	01
fmOpenReadWrite	00
fmShareDenyWrite	10
fmShareExclusive	00
fmShareDenyRead	01
fmShareDenyNone	11

Pierwszy program otworzył plik w trybie 10 i trybie współdzielenia 01

Drugi program chce otworzyć plik w trybie 00 i trybie współdzielenia 10

Czy drugi program będzie mógł otworzyć plik (0-nie, 1-tak, 2-to zależy jeszcze od innych okoliczności)?

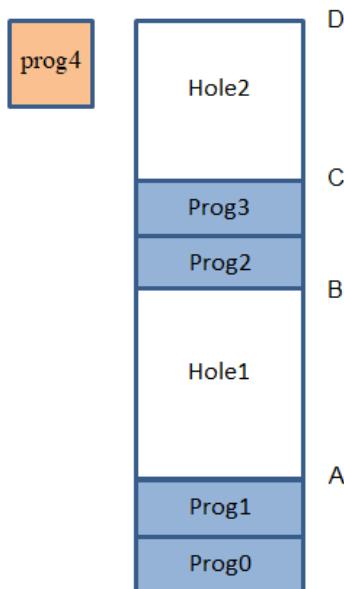
Odpowiedź:  ×

Poprawna odpowiedź to: 0

**Pytanie 11**

Poprawnie

Punkty: 3,00 z 3,00



W powyższym stanie alokacji pamięci 4 programy są już w pamięci, a 5. program czeka na załadowanie do pamięci. Granice dziur to:

- A - 2K
- B - 3K
- C - 12K
- D - 19K

Pamięć jest przydzielana programom w zasadzie pierwszego dopasowania FIRST-FIT, bez tworzenia nowej dziury, jeśli przydzielony blok jest większy niż zapotrzebowanie. Pamięć jest skanowana w poszukiwaniu dziury, zaczynając od niższych adresów.

Jaka będzie wewnętrzna fragmentacja po załadowaniu programu E o rozmiarze 5K do pamięci?

Odpowiedź:

===== for teacher =====

1 7

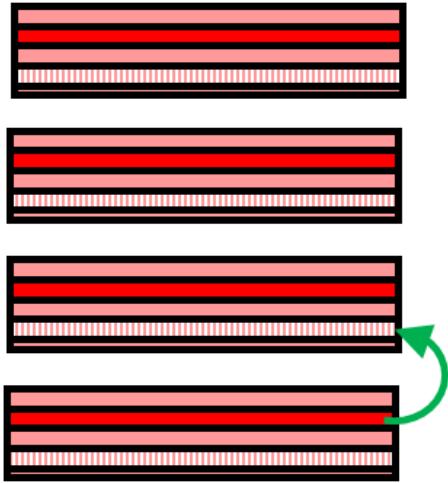
Poprawna odpowiedź to: 2

**Pytanie 12**

Niepoprawnie

Punkty: 0,00 z 3,00

Na pokazanym "zdjęciu migawkowym" stosu programu, pokazano łącznik statyczny. Stos rozwija się "w dół" Podprogram wskazywany przez strzałkę jest w hierarchii "rodzicem" podprogramu na szczytce stosu. Czy podprogram na szczytce stosu mógł zostać wywołany rekursywnie?

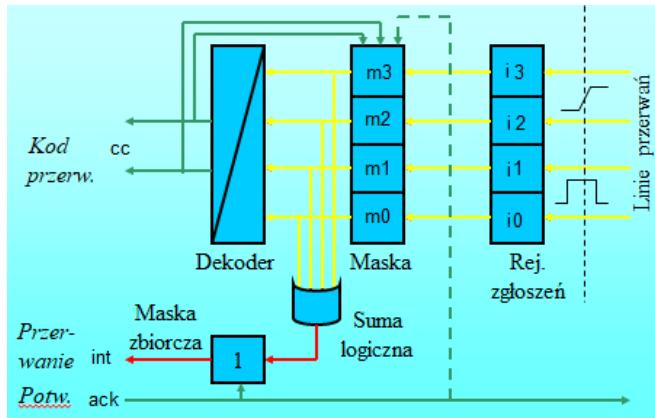
 Prawda ✗ Fałsz

Poprawną odpowiedzią jest "Fałsz".

**Pytanie 13**

Nie udzielono odpowiedzi

Punkty maks.: 3,00



W podanej strukturze układu przerwań maska przerwań ma postać 1110 (od m3 do m0), oraz są zgłoszone przerwania 0010 (od i3 do i0).

Przerwanie o indeksie 3 ma najwyższy priorytet.

Jaka będzie wartość kodu przerwania cc przesłany do procesora (podaj wartość dziesiętnie)?

Jeżeli żadne przerwanie nie zostanie zgłoszone, wpisz -1

Odpowiedź:  ×

Poprawna odpowiedź to: 1

**Pytanie 14**

Nie udzielono odpowiedzi

Punkty maks.: 3,00

Organizacja pamięci i procesora jest słownowa (int też zajmuje 1 słowo)

zmienna a ma wartość #2494

szczyt stosu (pełny zstępujący) #c800

ramka stosu przed wywołaniem podprogramu B #c81d

adres podprogramu B #085b

Zasady wywoływania: konwencja języka C, bez połączenia statycznego, wynik funkcji przekazywany w rejestrach. Zawartość stosu pokazano po wywołaniu podprogramu B, oraz potem rekursywnie przez samego siebie, w punkcie etykiety C. Podprogram B jest wywołany po raz pierwszy B(a); gdzieś w programie spod adresu #9cff. Etykieta C (adres wywołania funkcji B) ma adres #0886

niezależnie od języka programowania, podprogram B ma postać

B(i);

{

C:      B(i-2);

}

Podaj zawartość komórki pod adresem #c7fc jako liczbę heksadecymalną bez #.

Adres	zawartość
#c800	????
#c7ff	#2494
#c7fe	#9d00
#c7fd	#c81d
#c7fc	
#c7fb	#0887
#c7fa	#c7fd
#c7f9	????

Odpowiedź:



Poprawna odpowiedź to: 2492

**Pytanie 15**

Nie udzielono odpowiedzi

Punkty maks.: 3,00

Adres wirtualny składa się z 7b nr strony i 9b przemieszczenia. Tabela indeksowa stron jest ukazana poniżej (indeks, zawartość). Dla adresu równego dziesiętnie 3632, binarnie 0000 1110 0011 0000, podać adres fizyczny w postaci: nr ramki,przemieszczenie (jako liczby dziesiętne, przemieszczenie na 3 cyfrach). Na przykład dla adresu fizycznego składającego się z ramki 0 i przemieszczenia 18 należy podać 0,018. Jeżeli dla podanego adresu wirtualnego nie ma adresu fizycznego to należy podać -1.

7	4
6	5
5	7
4	-1
3	6
2	9
1	2
0	-1

Odpowiedź:  ✗

Poprawna odpowiedź to: 4,048

**Pytanie 16**

Poprawnie

Punkty: 3,00 z 3,00

Jaki jest średni czas w systemie dla zadań wsadowych, przy użyciu algorytmu SJF?

W systemie są 3 procesory

zadanie	1	2	3	4
czas przetwarzania	3,5	4,5	2,9	1,8

Odpowiedź:  ✓

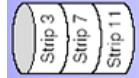
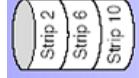
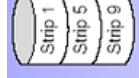
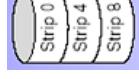
Poprawna odpowiedź to: 3,6

**Pytanie 17**

Nie udzielono odpowiedzi

Punkty maks.: 3,00

W macierzy RAID 4 dane są umieszczane w porcjach (Strips), które są "rozrzucone" po dyskach danych, tak że każda kolejna porcja znajduje się na kolejnym dysku danych, modulo liczba dysków. Do tego występuje dysk parzystości, który przechowuje bity parzystości zerowych bitów, pierwszych bitów, drugich bitów itd., porcji o równych numerach podzielonych przez liczbę dysków danych, na przykład porcji 0-3, 4-7, 8-11 itd.:

**dysk parz.****dysk 3****dysk 2****dysk 1****dysk 0**

początek porcji 0,1,2,3 wygląda następująco:

0	1	0	0	1	Dysk parz.
0	0	0	0	0	Dysk 3
1	0	1	1	0	Dysk 2
1	1	0	1	0	Dysk 1
0	1	1	0	0	Dysk 0

W porcji parzystości wartości są umieszczone tak, aby bit parzystości zachowywał nieparzystość odpowiednich bitów porcji 0-3. Dysk 3 został uszkodzony i odczytuje same 0. Po wymianie dysku na nowy, jakie wartości należy umieścić w porcji na dysku 3?

Podaj wartości kolejnych bitów na dysku 3, bez żadnych separatorów pomiędzy nimi, na przykład 00000

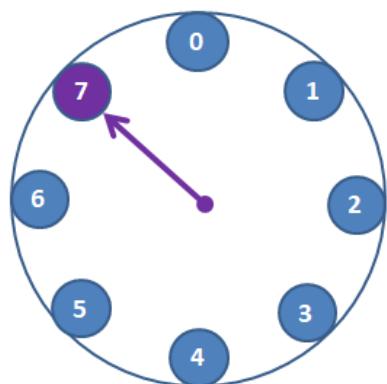
Odpowiedź:  ×

Poprawna odpowiedź to: 10110

**Pytanie 18**

Niepoprawnie

Punkty: 0,00 z 3,00



strona	4	5	6	7	0	1	2	3
bit R	1	1	1	0	1	0	1	1

Używając powyższej listy dla zegarowego algorytmu wymiany, która strona zostanie wysłana na dysk jako pierwsza? Podaj numer strony.

Bieżąca pozycja „wskaźówki” to 4 (niezależnie od pozycji na obrazku).

Odpowiedź:  ×

Poprawna odpowiedź to: 7

<b>It has started</b>	Monday, June 16, 2025, 10:39 AM
<b>Condition</b>	Completed
<b>Completed</b>	Monday, June 16, 2025, 11:52 AM
<b>Time used</b>	1 hour 13 minutes
<b>Points</b>	40.00/40.00
<b>Rate</b>	25.00 points out of 25.00 possible points ( 100 %)

**Question 1**

Correctly

Points: 1.00 out of 1.00

Discontinuous allocation is the result of:

Select all correct:

- a. relocation
- b. compaction
- c. segmentation ✓
- d. paging ✓

Your answer is correct.

The correct answers are: paging, segmantation

**Question 2**

Correctly

Points: 1.00 out of 1.00

Interrupt vector:

Select all correct:

- a. and. contains the ID of the process that should be restarted
- b. contains minimal information that cannot be saved programmatically ✓
- c. contains the instruction counter, condition bits, interrupt mask, and general purpose registers
- d. it is saved automatically when an interrupt is accepted ✓

Your answer is correct.

The correct answers are: it is saved automatically when an interrupt is accepted, contains minimal information that cannot be saved programmatically

**Pytanie 3**

Poprawnie

Punkty: 1,00 z 1,00

WORST-FIT algorithm:

Wybierz wszystkie poprawne:

- a. It allows for fast determining whether there is a free block of the required size ✓
- b. It is designed to reduce external fragmentation ✓
- c. Requires a descending sort of the list of free blocks ✓
- d. Requires sorting the cut part into the list of free blocks ✓

Twoja odpowiedź jest poprawna.

Prawidłowymi odpowiedziami są: Requires a descending sort of the list of free blocks, It allows for fast determining whether there is a free block of the required size, It is designed to reduce external fragmentation, Requires sorting the cut part into the list of free blocks

**Pytanie 4**

Poprawnie

Punkty: 1,00 z 1,00

Which of the following memory allocation schemes causes external fragmentation?

- a. Multiple contiguous fixed partitions of various sizes ✓
- b. Multiple contiguous fixed partitions of equal size
- c. Paging
- d. Sweeping ✓

Prawidłowymi odpowiedziami są: Sweeping, Multiple contiguous fixed partitions of various sizes

**Pytanie 5**

Poprawnie

Punkty: 1,00 z 1,00

What is true about system level threads?

- a. Thread switching does not require interaction with the operating system.
- b. All threads of the process execute physically simultaneously.
- c. All process threads share the same address space. ✓
- d. All process threads can share the same set of open files. ✓

Prawidłowymi odpowiedziami są: All process threads can share the same set of open files., All process threads share the same address space.

**Pytanie 6**

Poprawnie

Punkty: 1,00 z 1,00

For concurrency in OS:

- a. cache memory is necessary
- b. timer interrupts are necessary
- c. special processor support is required
- d. interrupt handling is necessary ✓

Poprawna odpowiedź to: interrupt handling is necessary

**Pytanie 7**

Poprawnie

Punkty: 1,00 z 1,00

The interrupt acceptance sequence consists of (in the sequence):

Wybierz wszystkie poprawne:

- a. identification of the interrupt level, saving the interrupt vector, performing a jump according to the interrupt table
- b. identification of the interrupt level, performing a jump according to the interrupt table, saving the interrupt vector
- c. identification of the interrupt level, saving the interrupt vector, performing a jump with a trace according to the interrupt table ✓
- d. identification of the interrupt level, performing a jump with the trace according to the interrupt table, saving the interrupt vector

Twoja odpowiedź jest poprawna.

Poprawna odpowiedź to: identification of the interrupt level, saving the interrupt vector, performing a jump with a trace according to the interrupt table

**Pytanie 8**

Poprawnie

Punkty: 3,00 z 3,00

For the disk operation scheduling Cyclic SCAN method, the currently being executed operation is in 30 cylinder. The direction in the Cyclic SCAN method is ascending. The next scheduled operations (in the order of their queuing) are:

Operation number	1	2	3	4	5
Cylinder number	41	24	25	34	40

For the next disk operation, enter the head travel distance (in cylinders) between the current and next operation.

Odpowiedź:  ✓

Poprawna odpowiedź to: 4

**Pytanie 9**

Poprawnie

Punkty: 3,00 z 3,00

When opening a file, we specify the opening mode and the sharing mode.

Let's encode the opening codes:

fmOpenRead	10
fmOpenWrite	01
fmOpenReadWrite	00
fmShareDenyWrite	10
fmShareExclusive	00
fmShareDenyRead	01
fmShareDenyNone	11

The first program opened the file in mode 01 and sharing mode 11

The second program wants to open the file in mode 00 and sharing mode 00

Will the second program be able to open the file (0-no, 1-yes, 2-it depends on other circumstances)?

Odpowiedź:  ✓

Poprawna odpowiedź to: 0

**Pytanie 10**

Poprawnie

Punkty: 3,00 z 3,00

page	M	R	belongs to process
1	0	1	3
2	1	1	3
3	0	0	4
4	1	0	6
5	0	1	2
6	0	1	5
7	1	1	5
8	0	0	5

Using the above table of the history of R bit for the pages in NRU swapping, with global frame allocation rule, which page will be sent to the disk first? The pages are scanned starting from the top. The process for which the frame is needed is 2. Provide a page number.

Odpowiedź: 3 ✓

Poprawna odpowiedź to: 3

**Pytanie 11**

Poprawnie

Punkty: 3,00 z 3,00

In RAID 4, data is placed in Strips that are "scattered" over the data disks, so that each subsequent strip is on the next data disk, modulo the number of disks. For this, there is a parity disk that holds the parity bits of zeroth bits, first bits, second bits, etc., equal-numbered strips divided by the number of data disks, for example, strips 0-3, 4-7, 8-11, etc.:



the start of strips 0,1,2,3 looks like this:

1	1	1	0	0	Parity disk
1	1	1	1	1	Disk 3
1	0	0	1	0	Disk 2
1	0	1	0	1	Disk 1
0	1	1	0	0	Disk 0

In the parity strip, the values are placed so that the parity bit keeps the corresponding strip bits 0-3 even.

Disk 3 has been corrupted and always reads 1. After replacing the disk with a new one, what values should I put in the strip on disk 3?

Enter the values of the consecutive bits on disk 3, without any separators between them, for example 00000

Odpowiedź:  ✓

Poprawna odpowiedź to: 10111

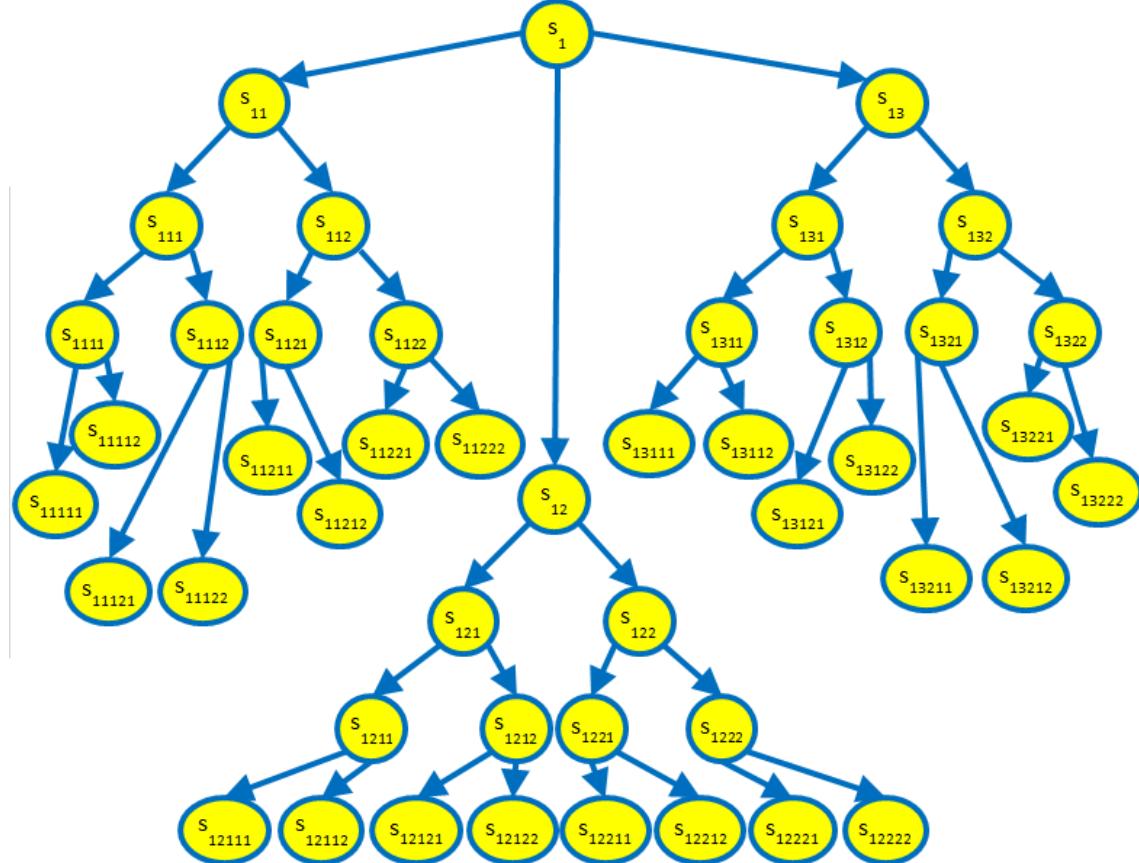
Pytanie 12

Poprawnie

Punkty: 3,00 z 3,00

The stack frame of which subroutine (specify the index) will be pointed by the static link in the frame of the subroutine S1222, that is called from the subroutine S12?

If the call is not possible, enter index -1.



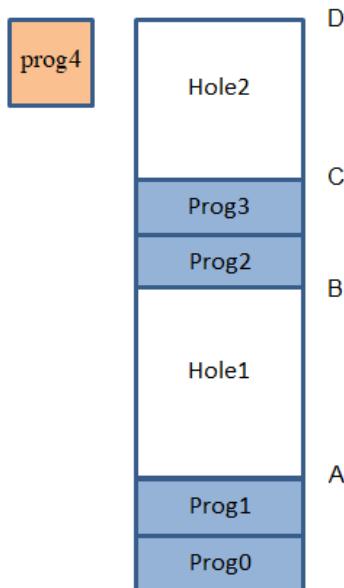
Odpowiedź:  ✓

Poprawna odpowiedź to: -1

**Pytanie 13**

Poprawnie

Punkty: 3,00 z 3,00



In the above memory allocation state, 4 programs are already in memory, and 5th program is waiting to be loaded into the memory. The borders of the holes are:

- A - 4K
- B - 6K
- C - 15K
- D - 17K

The memory is allocated to the programs in the worst-fit rule, without making a new hole if the allocated block is larger than the demand.

What will be the internal fragmentation after loading the program Prog4 of size 2K into memory?

Odpowiedź:

===== for teacher =====

22

Poprawna odpowiedź to: 0

**Pytanie 14**

Poprawnie

Punkty: 3,00 z 3,00

Assuming that memory cells are 1-byte, the page number in the address field is 13 bits, the offset is 13 bits, the frame number is 11 bits, and all entries in the TIS page index table are on a 4-byte word boundary, please specify:

- the maximum size of the physical memory in MB

Odpowiedź:

Poprawna odpowiedź to: 16

**Pytanie 15**

Poprawnie

Punkty: 3,00 z 3,00

We have the tasks with the following priorities in the access to a resource (a larger number is a higher priority):

Process number	1	2	3	4	5	6
Priority	45	44	39	38	42	31

The scheduling policy is preemptive, with the decision time constraint based on time slicing.

The current process is number 4. What process will get the resource in the nearest decision? Provide its priority.

Odpowiedź:

45



Poprawna odpowiedź to: 45

**Pytanie 16**

Poprawnie

Punkty: 3,00 z 3,00

The organization of memory and processor is word-based. A word means 16 bits. (int also takes 1 word) Hexadecimal values are preceded by a # character.

variable a has the value #a0c0

variable b has the value #a0a0

variable c has the value #a0a5

top of the stack (full descending, i.e. the stack pointer points to the most recently put element on the stack, and the stack expands towards lower addresses): #c100

address of subroutine A #1010

stack frame before calling subroutine A #c105

Calling rules: Parameters are put on the stack in accordance with the convention of the C language, i.e. starting from the last one, without a static link, the result of the function is passed in registers. The contents of the stack at label point C. Subroutine A is called A(c,b,a); from address #10a0.

regardless of the programming language, the subroutine header A has the form

A(int x,y,z);

{

    int p = z-y;

    int q = x-y;

C: ...

}

The content of the cell at address #c0fb: dynamic link



Address	content
#c100	????
#c0ff	#a0a5
#c0fe	#a0a0
#c0fd	#a0c0
#c0fc	#10a1
#c0fb	#c105
#c0fa	#0005
#c0f9	#0020
#c0f8	????

Twoja odpowiedź jest poprawna.

Poprawna odpowiedź to:

The organization of memory and processor is word-based. A word means 16 bits. (int also takes 1 word) Hexadecimal values are preceded by a # character.

variable a has the value #a0c0

variable b has the value #a0a0

variable c has the value #a0a5

top of the stack (full descending, i.e. the stack pointer points to the most recently put element on the stack, and the stack expands towards lower addresses): #c100

address of subroutine A #1010

stack frame before calling subroutine A #c105

Calling rules: Parameters are put on the stack in accordance with the convention of the C language, i.e. starting from the last one, without a static link, the result of the function is passed in registers. The contents of the stack at label point C. Subroutine A is called A(c,b,a); from address #10a0.

regardless of the programming language, the subroutine header A has the form

A(int x,y,z);

{

    int p = z-y;

    int q = x-y;

C: ...

}

The content of the cell at address #c0fb:[dynamic link]

Address	content
#c100	????
#c0ff	#a0a5
#c0fe	#a0a0
#c0fd	#a0c0
#c0fc	#10a1
#c0fb	#c105
#c0fa	#0005
#c0f9	#0020
#c0f8	????

**Pytanie 17**

Poprawnie

Punkty: 3,00 z 3,00

page	history of R
0	011000
1	011100
2	010001
3	010110
4	001011
5	001100
6	000011
7	000100

Using the above table of the history of R bit for the pages in LRU swapping, which page will be sent to the disk first? The oldest bit R is on the left. Provide a page number.

Odpowiedź:

6

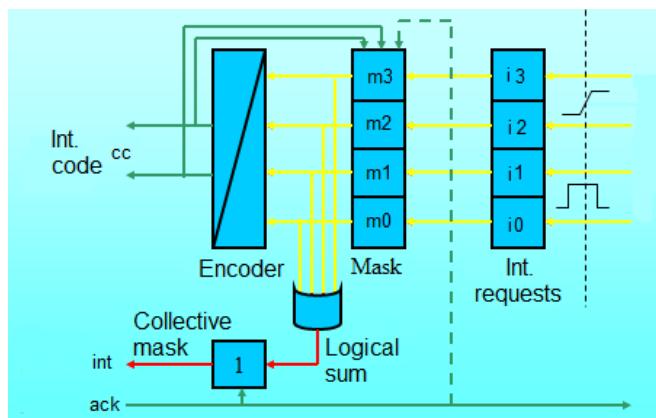


Poprawna odpowiedź to: 6

**Pytanie 18**

Poprawnie

Punkty: 3,00 z 3,00



In the given interrupt controller structure, the interrupt mask is 1110 (from m3 to m0), and interrupts 0011 (from i3 to i0) are reported.

The interrupt with index 3 has the highest priority.

What will be the value of the interrupt code cc sent to the processor (provide the code in decimal)?

If no interrupt is reported, enter -1

Odpowiedź:  ✓

Poprawna odpowiedź to: 1

<b>Started on</b>	Monday, 16 June 2025, 10:22 AM
<b>State</b>	Finished
<b>Completed on</b>	Monday, 16 June 2025, 11:44 AM
<b>Time taken</b>	1 hour 21 mins
<b>Marks</b>	36.00/40.00
<b>Grade</b>	22.50 out of 25.00 (90%)

**Question 1**

Correct

Mark 1.00 out of 1.00

Consider the following sequence of address references:

123, 215, 600, 1234, 76, 96.

If the page size is 100, the order of page references is as follows:

- a. 1,2,6,12,0,0
- b. 0,2,6,12,0,0
- c. 12,21,60,123,7,9
- d. 1,2,6,12

The correct answer is: 1,2,6,12,0,0

**Question 2**

Correct

Mark 1.00 out of 1.00

The internal state of the program supervisor layer is available for:

- a. Applications
- b. File system layer
- c. User programs
- d. OS kernel

The correct answer is: OS kernel

**Question 3**

Correct

Mark 1.00 out of 1.00

What is true for simultaneous execution in the same context?

- a. Threads minimize context switch time.
- b. A multiprocessor kernel can be concurrent
- c. The shared context forces threads to run on the same processor
- d. The use of threads ensures concurrency within the process.

The correct answers are: Threads minimize context switch time., The use of threads ensures concurrency within the process., A multiprocessor kernel can be concurrent

**Question 4**

Correct

Mark 1.00 out of 1.00

The scheduler decisions take the form:

Select one or more:

- a. change from waiting to ready state
- b. change from waiting to active state
- c. change from ready to active state
- d. change from active to ready state

Twoja odpowiedź jest poprawna.

The correct answer is: change from ready to active state

**Question 5**

Correct

Mark 1.00 out of 1.00

A memory management technique in which the system divides memory into equal-sized portions to easily manage relocation is called:

Select one or more:

- a. swapping
- b. mapping
- c. paging
- d. sweeping

Twoja odpowiedź jest poprawna.

The correct answer is: paging

**Question 6**

Incorrect

Mark 0.00 out of 1.00

The address translation function is:

Select one or more:

- a. multivalent
- b. reverse
- c. partial
- d. monotonic

Twoja odpowiedź jest niepoprawna.

The correct answers are: multivalent, partial

**Question 7**

Correct

Mark 1.00 out of 1.00

Multiprogramming is a technique in which,as a rule:

Select one or more:

- a. many programs can be stored in primary memory
- b. is a method of allocating processor time
- c. is a memory allocation method by which a program is divided into equal parts
- d. only addresses that can be generated by the processor when performing calculations are used

Twoja odpowiedź jest poprawna.

The correct answer is: many programs can be stored in primary memory

**Question 8**

Correct

Mark 3.00 out of 3.00

For the disk operation scheduling Cyclic SCAN method, the currently being executed operation is in 33 cylinder. The direction in the Cyclic SCAN method is descending. The next scheduled operations (in the order of their queuing) are:

Operation number	1	2	3	4	5
Cylinder number	40	41	28	29	25

For the next disk operation, enter the head travel distance (in cylinders) between the current and next operation.

Answer:

The correct answer is: 4

**Question 9**

Correct

Mark 3.00 out of 3.00

When opening a file, we specify the opening mode and the sharing mode.

Let's encode the opening codes:

fmOpenRead	10
fmOpenWrite	01
fmOpenReadWrite	00
fmShareDenyWrite	10
fmShareExclusive	00
fmShareDenyRead	01
fmShareDenyNone	11

The first program opened the file in mode 01 and sharing mode 01

The second program wants to open the file in mode 00 and sharing mode 00

Will the second program be able to open the file (0-no, 1-yes, 2-it depends on other circumstances)?

Answer:

The correct answer is: 0

**Question 10**

Correct

Mark 3.00 out of 3.00

page	Last used	Bit R	belongs to process
1	93	1	2
2	92	0	5
3	95	0	6
4	94	0	3
5	89	1	4
6	88	1	3
7	91	0	3
8	90	1	3

Using the above table of the history of R bit for the pages in Workset swapping algorithm, with priority frame allocation method, which page will be sent to the disk first? The current time slice number is 96, and the time range  $\tau$  for the workset is 3 (the threshold  $96-\tau=93$ ). Page scan starts from the top. The current process that needs a page to be loaded is 4. A process number is its priority (the greater number, the higher priority). Provide a page number to be sent to the disk.

Answer: 

The correct answer is: 7

**Question 11**

Correct

Mark 3.00 out of 3.00

In RAID 4, data is placed in Strips that are "scattered" over the data disks, so that each subsequent strip is on the next data disk, modulo the number of disks. For this, there is a parity disk that holds the parity bits of zeroth bits, first bits, second bits, etc., equal-numbered strips divided by the number of data disks, for example, strips 0-3, 4-7, 8-11, etc.:

the start of strips 0,1,2,3 looks like this:

1	1	1	0	0	Parity disk
0	0	0	0	0	Disk 3
1	0	0	1	0	Disk 2
1	1	0	1	0	Disk 1
0	1	1	0	0	Disk 0

In the parity strip, the values are placed so that the parity bit keeps the corresponding strip bits 0-3 even.

Disk 3 has been damaged and reads only 0. After replacing the disk with a new one, what values should be put in the strip on disk 3?

Enter the values of the consecutive bits on disk 3, without any separators between them, for example 00000

Answer:

The correct answer is: 11000

**Question 12**

Correct

Mark 3.00 out of 3.00

The figure shows the static nesting structure of subroutines. Subroutine s1212 makes a recursive call. To what stack frame (of which subroutine) will be the static link in the recursively called subroutine frame?

Enter the name of the subroutine with the index, without the letter "s", e.g. for s11122, enter 11122

Answer:

The correct answer is: 121

**Question 13**

Correct

Mark 3.00 out of 3.00

In the above memory allocation state, 4 programs are already in memory, and 5th program is waiting to be loaded into the memory. The borders of the holes are:

- A - 4K
- B - 6K
- C - 13K
- D - 17K

The memory is allocated to the programs in the worst-fit rule, without making a new hole if the allocated block is larger than the demand.

What will be the internal fragmentation after loading the program Prog4 of size 1K into memory?

Answer:

===== for teacher =====

2 4

The correct answer is: 3

**Question 14**

Correct

Mark 3.00 out of 3.00

Assuming that memory cells are 1-byte, the page number in the address field is 13 bits, the offset is 13 bits, the frame number is 11 bits, and all entries in the TIS page index table are on a 4-byte word boundary, specify:

- TIS maximum size of the program in kB

Answer:

The correct answer is: 32

**Question 15**

Correct

Mark 3.00 out of 3.00

What is the average time in the system for tasks in the batch, using SJF algorithm?

task	1	2	3	4
processing time	3.8	4.5	2.6	1.2

Answer: 6.175

The correct answer is: 6.2

**Question 16**

Incorrect

Mark 0.00 out of 3.00

The stack is full descending, that is, the stack pointer points to the most recently put element on the stack, and the stack expands towards lower addresses. Memory is byte-organized (individual bytes are addressed). Every piece of data occupies 8 bytes (also, memory cells and general-purpose registers). Parameters are pushed on the stack by C convention, starting with the last one. The static link is pushed on the stack after the parameters. The subroutine has local variables: 4, which occupy 1 memory cell each. After calling the subroutine with parameters: 4, occupying 1 memory cell each, the trace will be at the address relative to the SP (decimal number should be entered):

Answer: 32

The correct answer is: 40

**Question 17**

Correct

Mark 3.00 out of 3.00

page	6	7	0	1	2	3	4	5
R bit	1	1	1	0	1	0	1	0

Using the above list for the Clock swapping algorithm, which page will be sent to the disk first? Provide a page number.

The current position of the "arrow" is 6 (regardless of the position in the picture), and the algorithm works clockwise.

Answer: 1

The correct answer is: 1

**Question 18**

Correct

Mark 3.00 out of 3.00

In the given interrupt controller structure, the interrupt mask is 1110 (from m3 to m0), and interrupts 0010 (from i3 to i0) are reported.

The interrupt with index 3 has the highest priority.

What will be the new value of the interrupt mask? Provide the bits .m3m2m1m0 (mask preceded by a point), for example .0101

Answer:

The correct answer is: 0.1100

<b>Started on</b>	Monday, 16 June 2025, 10:06 AM
<b>State</b>	Finished
<b>Completed on</b>	Monday, 16 June 2025, 11:51 AM
<b>Time taken</b>	1 hour 44 mins
<b>Marks</b>	31.00/40.00
<b>Grade</b>	19.38 out of 25.00 (77.5%)

**Question 1**

Correct

Mark 1.00 out of 1.00

When the processor is released, the scheduler selects one of the queued processes:

Select one or more:

- a. running
- b. ready ✓
- c. suspended
- d. waiting

Twoja odpowiedź jest poprawna.

The correct answer is: ready

**Question 2**

Correct

Mark 1.00 out of 1.00

The thread is also called:

- a. lightweight process ✓
- b. heavy process
- c. overlay process
- d. data process

The correct answer is: lightweight process

**Question 3**

Correct

Mark 1.00 out of 1.00

Which swapping algorithms use the history of page references (when was it last used or in which time slices was it used)?

Select one or more:

- a. working set ✓
- b. NRU
- c. LRU ✓
- d. clock
- e. FIFO
- f. second chance ✓
- g. LFU ✓
- h. no algorithm

Twoja odpowiedź jest poprawna.

The correct answers are: second chance, LRU, LFU, working set

**Question 4**

Correct

Mark 1.00 out of 1.00

The hardware resources of a computer system are:

Select one or more:

- a. Virtual memory
- b. Processor time ✓
- c. Peripheral devices ✓
- d. Windows on the screen

Twoja odpowiedź jest poprawna.

The correct answers are: Processor time, Peripheral devices

**Question 5**

Correct

Mark 1.00 out of 1.00

Collective interrupt mask is:

Select one or more:

- a. a register that blocks or unlocks a non-maskable interrupt
- b. a register that blocks or unblocks all interrupts ✓
- c. register in which the address of the interrupt controller is stored
- d. a combinational circuit that calculates the number of the interrupt received

Twoja odpowiedź jest poprawna.

The correct answer is: a register that blocks or unblocks all interrupts

**Question 6**

Correct

Mark 1.00 out of 1.00

Page Index Table address is kept in:

Select one or more:

- a. page table base register ✓
- b. page register
- c. stack pointer
- d. program counter

Twoja odpowiedź jest poprawna.

The correct answer is: page table base register

**Question 7**

Correct

Mark 1.00 out of 1.00

A concurrent system is one that, in principle:

Select one or more:

- a. It runs on a multiprocessor computer
- b. It allows multiple programs/processes/threads to run physically simultaneously
- c. Requires the use of timer interrupts
- d. Allows multiple programs/processes/threads to run simultaneously or seemingly simultaneously ✓

Twoja odpowiedź jest poprawna.

The correct answer is: Allows multiple programs/processes/threads to run simultaneously or seemingly simultaneously

**Question 8**

Correct

Mark 3.00 out of 3.00

For the disk operation scheduling Cyclic SCAN method, the currently being executed operation is in 49 cylinder. The direction in the Cyclic SCAN method is ascending. The next scheduled operations (in the order of their queuing) are:

Operation number	1	2	3	4	5
Cylinder number	60	43	46	53	59

For the next disk operation, enter the head travel distance (in cylinders) between the current and next operation.

Answer:  ✓

The correct answer is: 4

**Question 9**

Correct

Mark 3.00 out of 3.00

When opening a file, we specify the opening mode and the sharing mode.

Let's encode the opening codes:

fmOpenRead	10
fmOpenWrite	01
fmOpenReadWrite	00
fmShareDenyWrite	10
fmShareExclusive	00
fmShareDenyRead	01
fmShareDenyNone	11

The first program opened the file in mode 00 and sharing mode 01

The second program wants to open the file in mode 00 and sharing mode 00

Will the second program be able to open the file (0-no, 1-yes, 2-it depends on other circumstances)?

Answer:  

The correct answer is: 0

**Question 10**

Correct

Mark 3.00 out of 3.00

page	Last used	Bit R	belongs to process
1	93	1	2
2	92	0	5
3	95	0	6
4	94	0	3
5	89	1	4
6	88	1	3
7	91	0	3
8	90	1	3

Using the above table of the history of R bit for the pages in Workset swapping algorithm, with priority frame allocation method, which page will be sent to the disk first? The current time slice number is 96, and the time range  $\tau$  for the workset is 3 (the threshold  $96-\tau=93$ ). Page scan starts from the top. The current process that needs a page to be loaded is 4. A process number is its priority (the greater number, the higher priority). Provide a page number to be sent to the disk.

Answer:  ✓

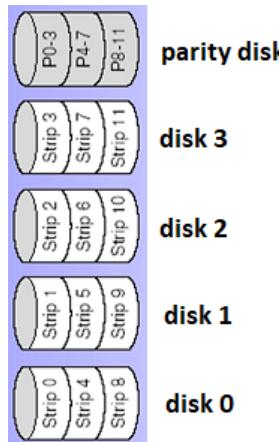
The correct answer is: 7

**Question 11**

Incorrect

Mark 0.00 out of 3.00

In RAID 4, data is placed in Strips that are "scattered" over the data disks, so that each subsequent strip is on the next data disk, modulo the number of disks. For this, there is a parity disk that holds the parity bits of zeroth bits, first bits, second bits, etc., equal-numbered strips divided by the number of data disks, for example, strips 0-3, 4-7, 8-11, etc.:



the start of strips 0,1,2,3 looks like this:

0	1	0	0	1	Parity disk
0	0	0	0	0	Disk 3
1	0	1	1	0	Disk 2
1	0	1	0	1	Disk 1
0	1	1	0	0	Disk 0

In the parity strip, the values are placed so that the parity bit keeps the corresponding strip bits 0-3 odd.

Disk 3 has been damaged and reads only 0. After replacing the disk with a new one, what values should be put in the strip on disk 3?

Enter the values of the consecutive bits on disk 3, without any separators between them, for example 00000

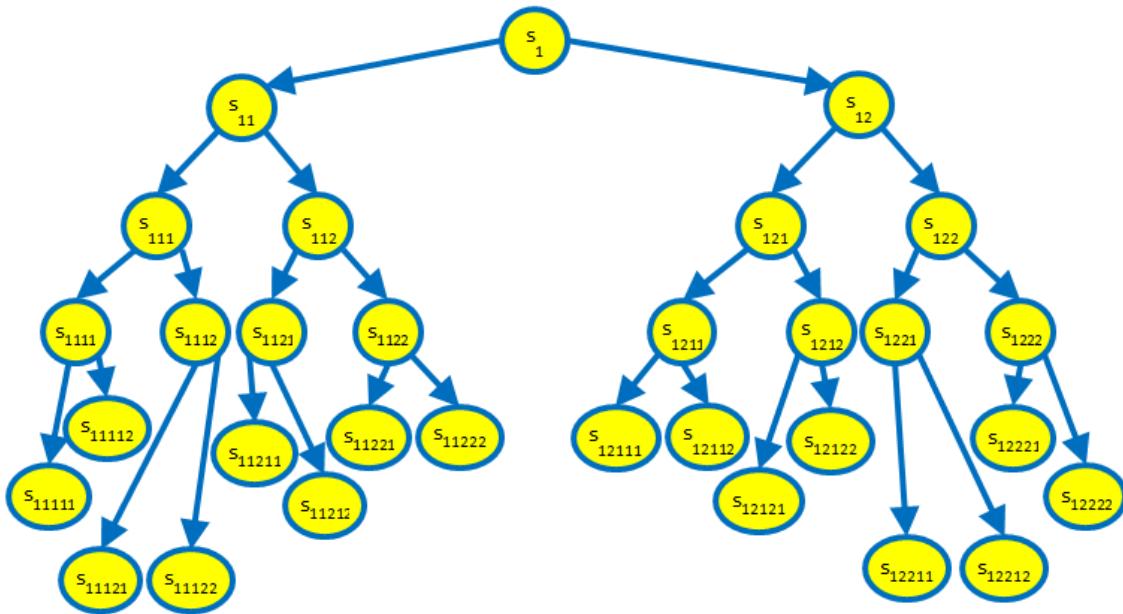
Answer:  ×

The correct answer is: 11001

**Question 12**

Correct

Mark 3.00 out of 3.00



Above is the nesting structure of subroutines in some program. Subroutine s121 calls its "parent" in the hierarchy. To what stack frame (which subroutine) will the dynamic link be made in the called subroutine frame?

Enter the name of the subroutine with the index, without the letter "s", e.g. for s1112 enter 11122

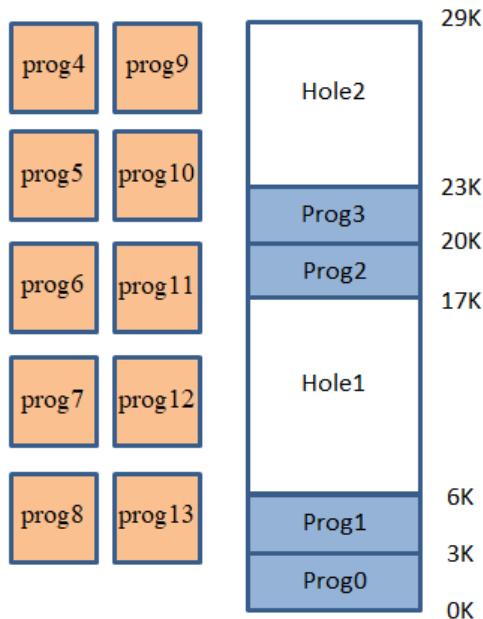
Answer: 121 ✓

The correct answer is: 121

**Question 13**

Correct

Mark 3.00 out of 3.00



In the above memory allocation state, 4 programs are already in memory, and 9 programs are waiting to be loaded into the memory, in the reverse order of their numbers. The programs waiting to be loaded into memory have the following sizes:

prog4 - 5K  
 prog5 - 7K  
 prog6 - 4K  
 prog7 - 6K  
 prog8 - 4K  
 prog9 - 4K  
 prog10 - 2K  
 prog11 - 4K  
 prog12 - 5K

The memory is allocated to the programs in the best-fit rule, with making a new hole if the allocated block is larger than the demand.

The programs are loaded into the memory in reverse order of their numbers (from 12 to 4).

Specify, which program will cause the memory compaction. Provide only the program number. If the compaction will not be needed, provide 0.

Answer:

The correct answer is: 8

**Question 14**

Incorrect

Mark 0.00 out of 3.00

Assuming that the instruction is 32 bits, the data accessed in the instructions is 2 or 4 bytes, the memory access addressing is on a double word (4 bytes) boundary, and the page size is 4kB, one instruction can cause the following number of "page fault" exceptions:

Answer:

6



The correct answer is: 2

**Question 15**

Correct

Mark 3.00 out of 3.00

We have the tasks with the following priorities in the access to a resource (a larger number is a higher priority):

Process number	1	2	3	4	5	6
Priority	40	41	32	33	33	28

The scheduling policy is preemptive, with the decision time constraint based on time slicing.

The current process is number 4. What process will get the resource in the nearest decision? Provide its priority.

Answer:

41



The correct answer is: 41

**Question 16**

Correct

Mark 3.00 out of 3.00

The organization of memory and processor is word. A word means 16 bits (int also takes one 16-bit word). Hexadecimal values are preceded by a # character.

variable a has the value #a0c0

top of the stack (full descending, i.e. the stack pointer points to the most recently put element on the stack, and the stack expands towards lower addresses) is #c100

stack frame before calling subroutine A: #c105

address of subroutine A #1001

Calling rules: Parameters are put on the stack in accordance with the convention of the C language, i.e. starting from the last one, without a static link, the result of the function is passed in registers. The stack is shown after subroutine A is called, at label point C. Subroutine A is called A(a,a,a); from address #1050.

Regardless of the programming language, subroutine A has the form

A(int x,y,z);

{

    int q = x+0x20;

C: ...

}

Specify what cell #c0fb contains:  ✓

Address	content	
#c100	????	
#c0ff	#a0c0	
#c0fe	#a0c0	
#c0fd	#a0c0	
#c0fc	#1051	
#c0fb	#c105	
#c0fa	#a0e0	
#c0f9	????	
#c0f8	????	

Twoja odpowiedź jest poprawna.

The correct answer is:

The organization of memory and processor is word. A word means 16 bits (int also takes one 16-bit word). Hexadecimal values are preceded by a # character.

variable a has the value #a0c0

top of the stack (full descending, i.e. the stack pointer points to the most recently put element on the stack, and the stack expands towards lower addresses) is #c100

stack frame before calling subroutine A: #c105

address of subroutine A #1001

Calling rules: Parameters are put on the stack in accordance with the convention of the C language, i.e. starting from the last one, without a static link, the result of the function is passed in registers. The stack is shown after subroutine A is called, at label point C. Subroutine A is called A(a,a,a); from address #1050.

Regardless of the programming language, subroutine A has the form

A(int x,y,z);

{

    int q = x+0x20;

C: ...

}

Specify what cell #c0fb contains:[dynamic link]

Address	content	
#c100	????	
#c0ff	#a0c0	
#c0fe	#a0c0	
#c0fd	#a0c0	
#c0fc	#1051	
#c0fb	#c105	
#c0fa	#a0e0	
#c0f9	????	
#c0f8	????	

**Question 17**

Correct

Mark 3.00 out of 3.00

page	M	R
1	1	0
2	0	0
3	0	1
4	0	1
5	1	0
6	0	0
7	0	1
8	1	1

Using the above table of the history of R bit for the pages in NRU swapping, which page will be sent to the disk first? The pages are scanned starting from the top. Provide a page number.

Answer:

2

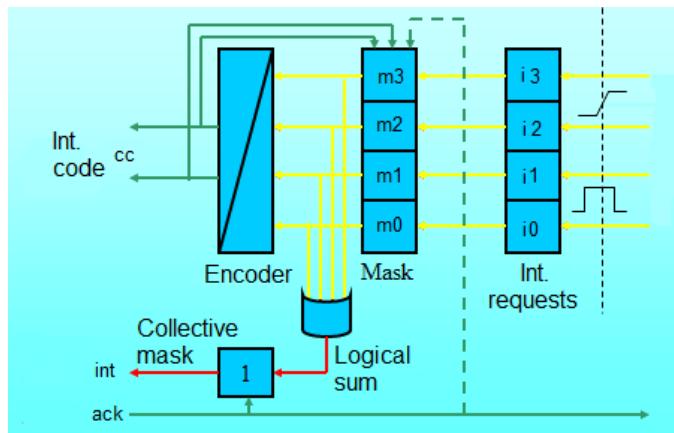


The correct answer is: 2

**Question 18**

Incorrect

Mark 0.00 out of 3.00



In the given interrupt controller structure, the interrupt mask is 0000 (from m3 to m0), and interrupts 1010 (from i3 to i0) are reported.

The interrupt with index 3 has the highest priority.

What will be the value of the interrupt code cc sent to the processor (provide the code in decimal)?

If no interrupt is reported, enter -1

Answer:  X

The correct answer is: -1

Rozpoczęto	poniedziałek, 16 czerwca 2025, 10:52
Stan	Ukończone
Ukończono	poniedziałek, 16 czerwca 2025, 11:52
Wykorzystany czas	59 min. 43 sek.
Punkty	28,67/40,00
Ocena	17,92 pkt. na 25,00 pkt. możliwych do uzyskania (71,67%)

**Pytanie 1**

Poprawnie

Punkty: 1,00 z 1,00

Paging - the key in associative memory is:

Wybierz wszystkie poprawne:

- a. frame number
- b. the frame number concatenated with the page number
- c. page number ✓
- d. the page number concatenated with the frame number

Twoja odpowiedź jest poprawna.

Poprawna odpowiedź to: page number

**Pytanie 2**

Częściowo poprawnie

Punkty: 0,50 z 1,00

WORST-FIT algorithm:

Wybierz wszystkie poprawne:

- a. Requires a descending sort of the list of free blocks ✓
- b. Requires sorting the cut part into the list of free blocks ✓
- c. It allows for fast determining whether there is a free block of the required size
- d. It is designed to reduce external fragmentation

Twoja odpowiedź jest częściowo poprawna.

Poprawnie wybrałeś (-łaś): 2.

Prawidłowymi odpowiedziami są: Requires a descending sort of the list of free blocks, It allows for fast determining whether there is a free block of the required size, It is designed to reduce external fragmentation, Requires sorting the cut part into the list of free blocks

**Pytanie 3**

Niepoprawnie

Punkty: 0,00 z 1,00

LRU algorithm consists in:

Wybierz wszystkie poprawne:

- a. Ejecting the most recently used page from memory
- b. Removing the least used page from memory ✗
- c. Downloading to memory the page that is most often needed
- d. Downloading to the memory of the page that will be needed as soon as possible

Twoja odpowiedź jest niepoprawna.

Poprawna odpowiedź to: Ejecting the most recently used page from memory

**Pytanie 4**

Częściowo poprawnie

Punkty: 0,67 z 1,00

The interrupt encoder is:

Wybierz wszystkie poprawne:

- a. a register that tells the processor the interrupt number to be handled
- b. a combinational circuit that calculates the value of a new individual interrupt mask
- c. a combinational circuit that computes the number of the reported and unmasked interrupt with the highest priority ✓
- d. a combinational circuit that transmits to the processor the number of the interrupt to be serviced ✓

Twoja odpowiedź jest częściowo poprawna.

Poprawnie wybrałeś (-łaś): 2.

Prawidłowymi odpowiedziami są: a combinational circuit that computes the number of the reported and unmasked interrupt with the highest priority, a combinational circuit that calculates the value of a new individual interrupt mask, a combinational circuit that transmits to the processor the number of the interrupt to be serviced

**Pytanie 5**

Częściowo poprawnie

Punkty: 0,50 z 1,00

Interrupt handling - sequence of actions:

1. saving a copy of the interrupt vector (PC and SR) ✓
2. switching to system mode (modification of PC and status register) ✓
3. switching to the system stack ✗
4. programmatic context saving ✗

Twoja odpowiedź jest częściowo poprawna.

Poprawnie wybrałeś (-łaś): 2.

Poprawna odpowiedź to: 1. → saving a copy of the interrupt vector (PC and SR), 2. → switching to system mode (modification of PC and status register), 3. → programmatic context saving, 4. → switching to the system stack

**Pytanie 6**

Poprawnie

Punkty: 1,00 z 1,00

The hardware mechanisms necessary for paging are

(note: "frame error" is also called "page fault", "frame fault"):

Wybierz wszystkie poprawne:

- a. Address translation, page index tables, "frame error" interrupt, associative memory, page swapper
- b. Address translation, page index tables, "frame error" interrupt ✓
- c. Address translation, page index tables, page reference bits, "frame error" interrupt
- d. Address translation, page index tables, page reference bits, "frame error" interrupt, associative memory

Twoja odpowiedź jest poprawna.

Poprawna odpowiedź to: Address translation, page index tables, "frame error" interrupt

**Pytanie 7**

Poprawnie

Punkty: 1,00 z 1,00

Conditional variables in a monitor

Wybierz wszystkie poprawne:

- a. They guard access to the critical region of the monitor
- b. They are used to suspend processes that cannot run because the conditions for their continuation are not met ✓
- c. They are used to check whether the conditions for process continuation are met

Twoja odpowiedź jest poprawna.

Poprawna odpowiedź to: They are used to suspend processes that cannot run because the conditions for their continuation are not met

**Pytanie 8**

Poprawnie

Punkty: 3,00 z 3,00

For the disk operation scheduling Cyclic SCAN method, the currently being executed operation is in 33 cylinder. The direction in the Cyclic SCAN method is descending. The next scheduled operations (in the order of their queuing) are:

Operation number	1	2	3	4	5
Cylinder number	42	41	30	31	25

For the next disk operation, enter the head travel distance (in cylinders) between the current and next operation.

Odpowiedź:

Poprawna odpowiedź to: 2

**Pytanie 9**

Poprawnie

Punkty: 3,00 z 3,00

When opening a file, we specify the opening mode and the sharing mode.

Let's encode the opening codes:

fmOpenRead	10
fmOpenWrite	01
fmOpenReadWrite	00
fmShareDenyWrite	10
fmShareExclusive	00
fmShareDenyRead	01
fmShareDenyNone	11

The first program opened the file in mode 01 and sharing mode 11

The second program wants to open the file in mode 00 and sharing mode 00

Will the second program be able to open the file (0-no, 1-yes, 2-it depends on other circumstances)?

Odpowiedź:

Poprawna odpowiedź to: 0

**Pytanie 10**

Niepoprawnie

Punkty: 0,00 z 3,00

frame	M	R	belongs to process (0-not used)
1	0	1	5
2	1	1	0
3	0	0	0
4	1	0	1
5	0	1	0
6	0	1	4
7	1	1	4
8	0	0	3

Using the above table, with the fixed frame allocation rule, which frame will be allocated to the process? The pages are scanned starting from the top. The process for which the frame is needed is 4. Provide a frame number.

Odpowiedź:  ×

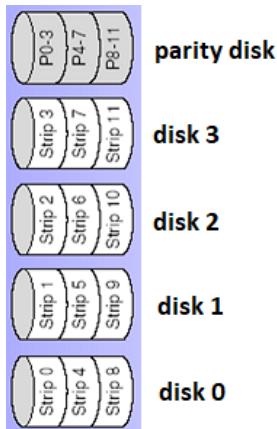
Poprawna odpowiedź to: 2

**Pytanie 11**

Poprawnie

Punkty: 3,00 z 3,00

In RAID 4, data is placed in Strips that are "scattered" over the data disks, so that each subsequent strip is on the next data disk, modulo the number of disks. For this, there is a parity disk that holds the parity bits of zeroth bits, first bits, second bits, etc., equal-numbered strips divided by the number of data disks, for example, strips 0-3, 4-7, 8-11, etc.:



the start of strips 0,1,2,3 looks like this:

1	1	1	0	0	Parity disk
0	0	0	0	0	Disk 3
1	0	0	1	0	Disk 2
1	0	1	0	1	Disk 1
0	1	1	0	0	Disk 0

In the parity strip, the values are placed so that the parity bit keeps the corresponding strip bits 0-3 even.

Disk 3 has been damaged and reads only 0. After replacing the disk with a new one, what values should be put in the strip on disk 3?

Enter the values of the consecutive bits on disk 3, without any separators between them, for example 00000

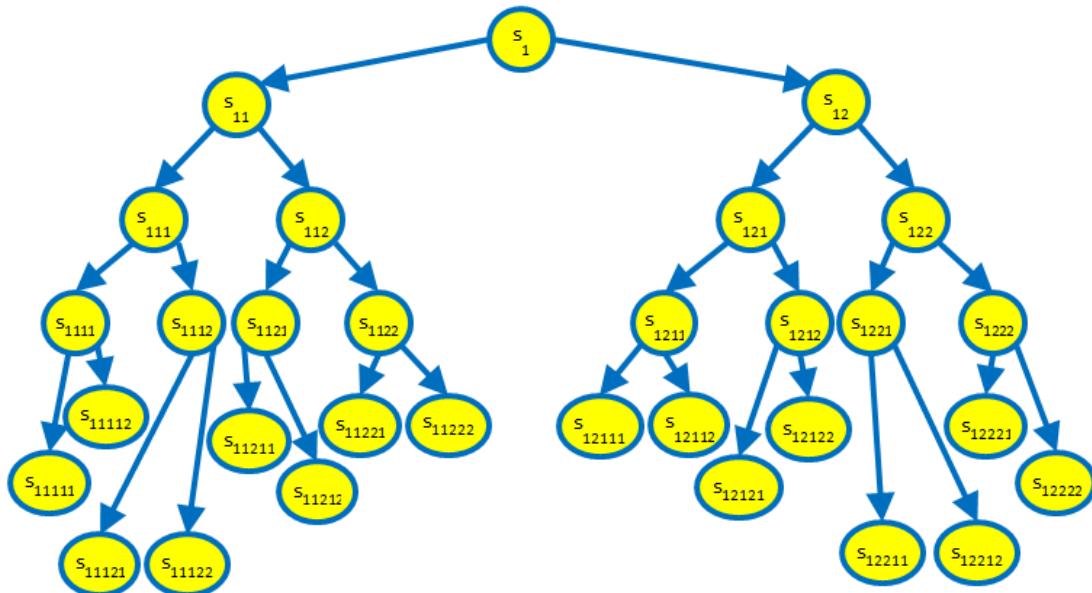
Odpowiedź:  ✓

Poprawna odpowiedź to: 10111

**Pytanie 12**

Niepoprawnie

Punkty: 0,00 z 3,00



Above is the nesting structure of subroutines in some program.

Can there be a dynamic link in subroutine frame s11111 to subroutine frame s11111 ?

answer 0-no, 1-yes

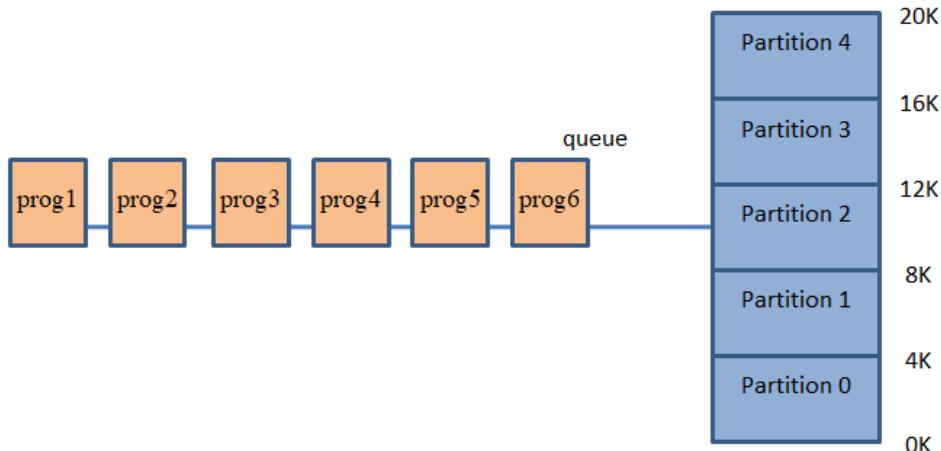
Odpowiedź:  ✗

Poprawna odpowiedź to: 1

Pytanie **13**

Poprawnie

Punkty: 3,00 z 3,00



In the above memory division, the programs waiting to be loaded into memory have the following sizes:

- prog1 - 4K
- prog2 - 5K
- prog3 - 4K
- prog4 - 6K
- prog5 - 6K
- prog6 - 5K

Programs are loaded into memory partitions (if possible) in the reverse order of their numbers, from 6 to 1.

Specify, which program will face the internal fragmentation problem as the first. Provide only the program number. If the internal fragmentation cannot occur, enter 0.

Odpowiedź:



Poprawna odpowiedź to: 0

**Pytanie 14**

Poprawnie

Punkty: 3,00 z 3,00

The virtual address consists of 6b page number and 10b offset. The page index table is shown below (index, content). For decimal address 6192, binary 0001 1000 0011 0000, specify the physical address in the form: frame number.offset (as decimal numbers, offset in 3 digits). For example, for a physical address consisting of frame 0 and offset 18, specify 0.018. If there is no physical address for the given virtual address, then -1 should be specified.

7	12
6	0
5	7
4	-1
3	9
2	5
1	3
0	-1

Odpowiedź: 0.048 ✓

Poprawna odpowiedź to: 0,048

**Pytanie 15**

Poprawnie

Punkty: 3,00 z 3,00

What is the average time in the system for tasks in the batch, using SJF algorithm?

task	1	2	3	4
processing time	3,4	5,3	2,3	1,1

Odpowiedź: 5.85 ✓

Poprawna odpowiedź to: 5,8

**Pytanie 16**

Poprawnie

Punkty: 3,00 z 3,00

The organization of memory and processor is word. A word means 16 bits (int also takes one 16-bit word). Hexadecimal values are preceded by a # character.

variable a has the value #a0c0

top of the stack (full descending, i.e. the stack pointer points to the most recently put element on the stack, and the stack expands towards lower addresses) is #c100

stack frame before calling subroutine A: #c105

address of subroutine A #1001

Calling rules: Parameters are put on the stack in accordance with the convention of the C language, i.e. starting from the last one, without a static link, the result of the function is passed in registers. The stack is shown after subroutine A is called, at label point C. Subroutine A is called A(a,a,a); from address #1050.

Regardless of the programming language, subroutine A has the form

A(int x,y,z);

{

    int q = x+0x20;

C: ...

}

Specify what cell #c0fe contains:  ✓

Address	content	
#c100	????	
#c0ff	#a0c0	
#c0fe	#a0c0	
#c0fd	#a0c0	
#c0fc	#1051	
#c0fb	#c105	
#c0fa	#a0e0	
#c0f9	????	
#c0f8	????	

Twoja odpowiedź jest poprawna.

Poprawna odpowiedź to:

The organization of memory and processor is word. A word means 16 bits (int also takes one 16-bit word). Hexadecimal values are preceded by a # character.

variable a has the value #a0c0

top of the stack (full descending, i.e. the stack pointer points to the most recently put element on the stack, and the stack expands towards lower addresses) is #c100

stack frame before calling subroutine A: #c105

address of subroutine A #1001

Calling rules: Parameters are put on the stack in accordance with the convention of the C language, i.e. starting from the last one, without a static link, the result of the function is passed in registers. The stack is shown after subroutine A is called, at label point C. Subroutine A is called A(a,a,a); from address #1050.

Regardless of the programming language, subroutine A has the form

```
A(int x,y,z);
{
    int q = x+0x20;
C: ...
}
```

Specify what cell #c0fe contains:[parameter y]

Address	content
#c100	????
#c0ff	#a0c0
#c0fe	#a0c0
#c0fd	#a0c0
#c0fc	#1051
#c0fb	#c105
#c0fa	#a0e0
#c0f9	????
#c0f8	????

Pytanie 17

Niepoprawnie

Punkty: 0,00 z 3,00

page nr	1	2	3	4	5	6	7	8	9
loaded	2	7	15	23	25	35	53	60	62
R bit	1	1	0	1	1	1	1	1	1

Using the above list for the FIFO-second chance swapping algorithm, what will be the bottom row after page replacement execution? The middle row is the number of a time slice in which a page was loaded to a frame. Provide a sequence of bits R for the pages; for example, before page replacement, the bottom row has the image 11011111. We assume that the loaded page gets R=0.

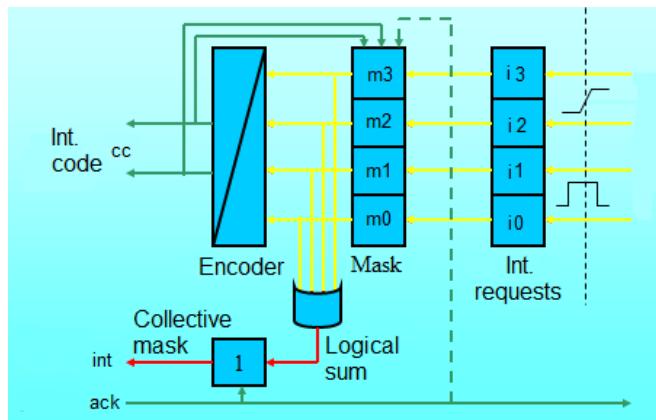
Odpowiedź: 00011111 ✖

Poprawna odpowiedź to: 111111100

**Pytanie 18**

Poprawnie

Punkty: 3,00 z 3,00



In the given interrupt controller structure, the interrupt mask is 1111 (from m3 to m0), and interrupts 1111 are reported (from i3 to i0).

The interrupt with index 3 has the highest priority.

What will be the value of the interrupt code cc sent to the processor (provide the code in decimal)?

If no interrupt is reported, enter -1

Odpowiedź:  ✓

Poprawna odpowiedź to: 3

**Started on** Monday, 16 June 2025, 10:27 AM

**State** Finished

**Completed on** Monday, 16 June 2025, 11:24 AM

**Time taken** 56 mins 58 secs

**Marks** 34.00/40.00

**Grade** 21.25 out of 25.00 (85%)

**Question 1**

Correct

Mark 1.00 out of 1.00

In UNIX, access rights are attributes:

Select one or more:

- a. A directory entry for a file
- b. User descriptor
- c. An entry in the I-node table ✓
- d. A special table specifying access rights

Twoja odpowiedź jest poprawna.

The correct answer is: An entry in the I-node table

**Question 2**

Correct

Mark 1.00 out of 1.00

Semaphore function is to:

- a. memory management
- b. process scheduling
- c. synchronize critical resources to prevent deadlock ✓
- d. synchronize processes for better CPU utilization

The correct answer is: synchronize critical resources to prevent deadlock

**Question 3**

Correct

Mark 1.00 out of 1.00

What paging element is NOT used in real-time systems?

Select one or more:

- a. reference bits
- b. protection bits
- c. address translation
- d. page swapping ✓

Twoja odpowiedź jest poprawna.

The correct answer is: page swapping

**Question 4**

Correct

Mark 1.00 out of 1.00

In a multitasking environment, the operating system decides which task the CPU gets, when, and for how long. This feature is called:

- a. task management
- b. task timetable management
- c. task scheduling ✓
- d. traffic control

The correct answer is: task scheduling

**Question 5**

Correct

Mark 1.00 out of 1.00

Dynamic relocation is performed by:

- a. Compiler
- b. Linker
- c. Special registers (DATUM) ✓
- d. Loader

The correct answer is: Special registers (DATUM)

**Question 6**

Correct

Mark 1.00 out of 1.00

The operating system plays the following role in a computer system:

Select one or more:

- a. relational database management
- b. computer system resource management ✓
- c. Create a concurrent environment ✓
- d. creating abstraction (virtualization) of hardware ✓

Twoja odpowiedź jest poprawna.

The correct answers are: Create a concurrent environment, computer system resource management, creating abstraction (virtualization) of hardware

**Question 7**

Correct

Mark 1.00 out of 1.00

For address translation, the following is used:

Select one or more:

- a. index table ✓
- b. associative translation buffer ✓
- c. reference and protection bits
- d. translation register

Twoja odpowiedź jest poprawna.

The correct answers are: index table, associative translation buffer

**Question 8**

Correct

Mark 3.00 out of 3.00

For the disk operation scheduling SCAN method, the currently being executed operation is in 40 cylinder. The direction in the SCAN method is descending. The next scheduled operations (in the order of their queuing) are:

Operation number	1	2	3	4	5
Cylinder number	49	48	39	36	32

For the next disk operation, enter the head travel distance (in cylinders) between the current and next operation.

Answer:

The correct answer is: 1

**Question 9**

Correct

Mark 3.00 out of 3.00

When opening a file, we specify the opening mode and the sharing mode.

Let's encode the opening codes:

fmOpenRead	10
fmOpenWrite	01
fmOpenReadWrite	00
fmShareDenyWrite	10
fmShareExclusive	00
fmShareDenyRead	01
fmShareDenyNone	11

The first program opened the file in mode 01 and sharing mode 11

The second program wants to open the file in mode 00 and sharing mode 01

Will the second program be able to open the file (0-no, 1-yes, 2-it depends on other circumstances)?

Answer:

The correct answer is: 1

**Question 10**

Incorrect

Mark 0.00 out of 3.00

page	M	R	belongs to process
1	0	0	2
2	1	0	5
3	0	1	4
4	1	1	3
5	0	0	5
6	0	0	4
7	1	0	5
8	0	1	5

Using the above table of bits M and R for the pages in NRU swapping, with the priority frame allocation rule, which page will be sent to the disk first? The pages are scanned starting from the top. A process number is its priority (the smaller number, the higher priority). The process for which the frame is needed is 5. Provide a page number.

Answer:

The correct answer is: 5

**Question 11**

Correct

Mark 3.00 out of 3.00

In RAID 4, data is placed in Strips that are "scattered" over the data disks, so that each subsequent strip is on the next data disk, modulo the number of disks. For this, there is a parity disk that holds the parity bits of zeroth bits, first bits, second bits, etc., equal-numbered strips divided by the number of data disks, for example, strips 0-3, 4-7, 8-11, etc.:



the start of strips 0,1,2,3 looks like this:

1	1	1	0	0	Parity disk
1	1	1	1	1	Disk 3
1	0	0	1	0	Disk 2
1	1	0	0	1	Disk 1
0	1	1	0	0	Disk 0

In the parity strip, the values are placed so that the parity bit keeps the corresponding strip bits 0-3 even.

Disk 3 has been corrupted and always reads 1. After replacing the disk with a new one, what values should I put in the strip on disk 3?

Enter the values of the consecutive bits on disk 3, without any separators between them, for example 00000

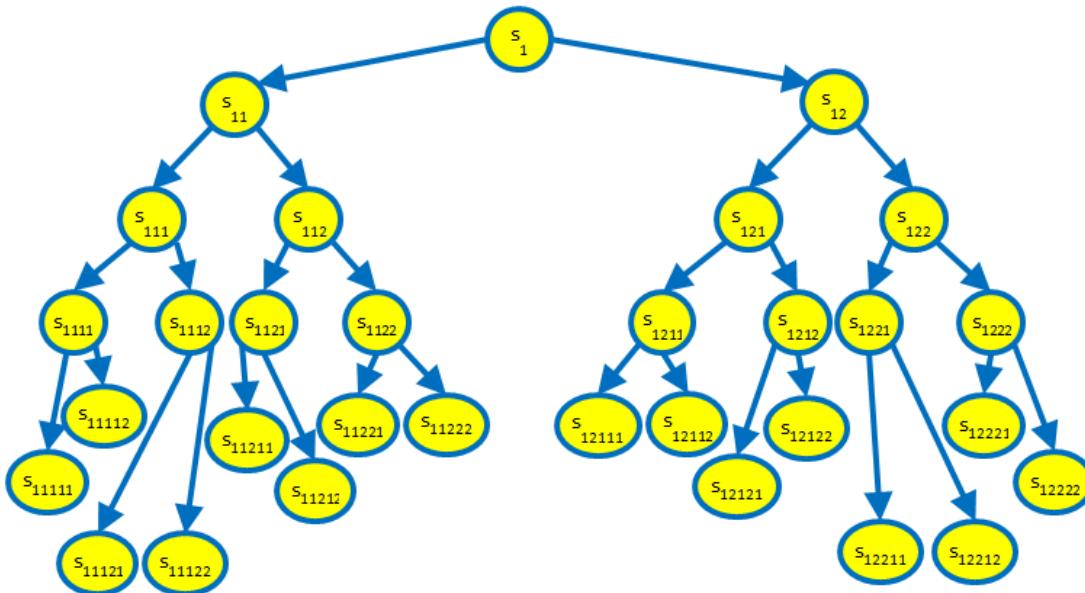
Answer:  ✓

The correct answer is: 11011

Question 12

Correct

Mark 3.00 out of 3.00



Above is the nesting structure of subroutines in some program.

Can there be a static link in subroutine s1111 stack frame to subroutine s1111 frame ?

answer: 0-no, 1-yes

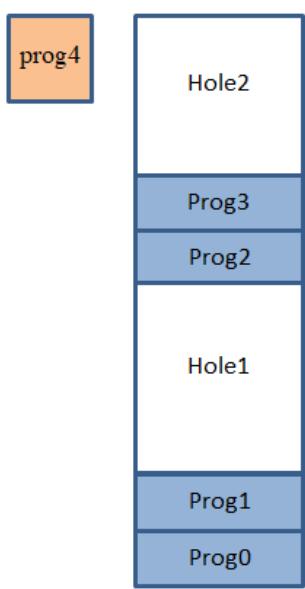
Answer:  ✓

The correct answer is: 0

Question 13

Correct

Mark 3.00 out of 3.00



In the above memory allocation state, 4 programs are already in memory, and 5th program is waiting to be loaded into the memory. The borders of the holes are:

- A - 2K
- B - 7K
- C - 12K
- D - 19K

The memory is allocated to the programs in the worst-fit rule, without making a new hole if the allocated block is larger than the demand.

What will be the internal fragmentation after loading the program Prog4 of size 2K into memory?

Answer:  ✓

===== for teacher =====

5 7

The correct answer is: 5

**Question 14**

Correct

Mark 3.00 out of 3.00

The virtual address consists of 7b page number and 9b offset. The page index table is shown below (index, content). For decimal address 672, binary 0000 0010 1010 0000, enter the physical address in the form: frame number.offset (as decimal numbers, offset to 3 digits). For example, for a physical address consisting of frame 0 and offset 18, specify 0.018. If there is no physical address for the given virtual address, then -1 should be specified.

7	4
6	5
5	-1
4	11
3	6
2	9
1	-1
0	1

Answer: 

The correct answer is: -1.000

**Question 15**

Correct

Mark 3.00 out of 3.00

What is the average time in the system for tasks in the batch, using SJF algorithm?

task	1	2	3	4
processing time	3.4	5.3	2.3	1.1

Answer: 

The correct answer is: 5.8

**Question 16**

Incorrect

Mark 0.00 out of 3.00

The stack is full descending, that is, the stack pointer points to the most recently put element on the stack, and the stack expands towards lower addresses. Memory is byte-organized (individual bytes are addressed). Every piece of data occupies 2 bytes (also, memory cells and general-purpose registers). Parameters are pushed on the stack by C convention, starting with the last one. The static link is pushed on the stack after the parameters. The subroutine has local variables: 4, which occupy 1 memory cell each. After calling the subroutine with parameters: 2, occupying 1 memory cell each, the static link will be at the address relative to the SP (decimal number should be entered):

Answer: 

The correct answer is: 12

**Question 17**

Correct

Mark 3.00 out of 3.00

page	history of R
0	001001
1	001110
2	000011
3	000111
4	011011
5	011100
6	010011
7	010111

Using the above table of the history of R bit for the pages in LRU swapping, which page will be sent to the disk first? The oldest bit R is on the left. Provide a page number.

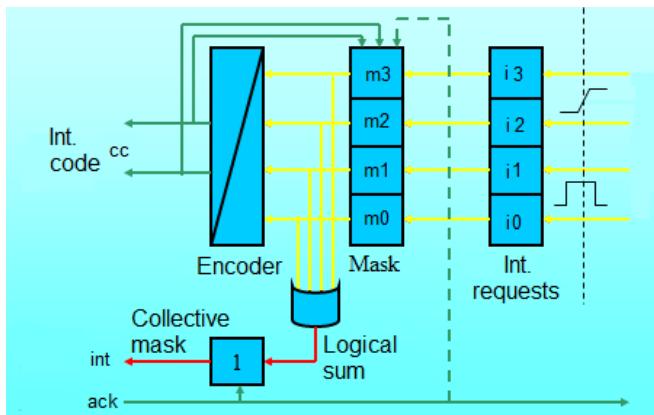
Answer:  ✓

The correct answer is: 2

**Question 18**

Correct

Mark 3.00 out of 3.00



In the given interrupt controller structure, the interrupt mask is 1100 (from m3 to m0). Enter the interrupt number from 0 to 3, without the prefix "i", that caused this mask form.

The interrupt with index 3 has the highest priority.

If no interrupt could cause this mask form, enter -1.

Answer:  ✓

The correct answer is: 1

<b>It has started</b>	Monday, June 16, 2025, 10:39 AM
<b>Condition</b>	Completed
<b>Completed</b>	Monday, June 16, 2025, 11:52 AM
<b>Time used</b>	1 hour 13 minutes
<b>Points</b>	40.00/40.00
<b>Rate</b>	25.00 points out of 25.00 possible points ( 100 %)

**Question 1**

Correctly

Points: 1.00 out of 1.00

Discontinuous allocation is the result of:

Select all correct:

- a. relocation
- b. compaction
- c. segmentation ✓
- d. paging ✓

Your answer is correct.

The correct answers are: paging, segmantation

**Question 2**

Correctly

Points: 1.00 out of 1.00

Interrupt vector:

Select all correct:

- a. and. contains the ID of the process that should be restarted
- b. contains minimal information that cannot be saved programmatically ✓
- c. contains the instruction counter, condition bits, interrupt mask, and general purpose registers
- d. it is saved automatically when an interrupt is accepted ✓

Your answer is correct.

The correct answers are: it is saved automatically when an interrupt is accepted, contains minimal information that cannot be saved programmatically

**Pytanie 3**

Poprawnie

Punkty: 1,00 z 1,00

WORST-FIT algorithm:

Wybierz wszystkie poprawne:

- a. It allows for fast determining whether there is a free block of the required size ✓
- b. It is designed to reduce external fragmentation ✓
- c. Requires a descending sort of the list of free blocks ✓
- d. Requires sorting the cut part into the list of free blocks ✓

Twoja odpowiedź jest poprawna.

Prawidłowymi odpowiedziami są: Requires a descending sort of the list of free blocks, It allows for fast determining whether there is a free block of the required size, It is designed to reduce external fragmentation, Requires sorting the cut part into the list of free blocks

**Pytanie 4**

Poprawnie

Punkty: 1,00 z 1,00

Which of the following memory allocation schemes causes external fragmentation?

- a. Multiple contiguous fixed partitions of various sizes ✓
- b. Multiple contiguous fixed partitions of equal size
- c. Paging
- d. Sweeping ✓

Prawidłowymi odpowiedziami są: Sweeping, Multiple contiguous fixed partitions of various sizes

**Pytanie 5**

Poprawnie

Punkty: 1,00 z 1,00

What is true about system level threads?

- a. Thread switching does not require interaction with the operating system.
- b. All threads of the process execute physically simultaneously.
- c. All process threads share the same address space. ✓
- d. All process threads can share the same set of open files. ✓

Prawidłowymi odpowiedziami są: All process threads can share the same set of open files., All process threads share the same address space.

**Pytanie 6**

Poprawnie

Punkty: 1,00 z 1,00

For concurrency in OS:

- a. cache memory is necessary
- b. timer interrupts are necessary
- c. special processor support is required
- d. interrupt handling is necessary ✓

Poprawna odpowiedź to: interrupt handling is necessary

**Pytanie 7**

Poprawnie

Punkty: 1,00 z 1,00

The interrupt acceptance sequence consists of (in the sequence):

Wybierz wszystkie poprawne:

- a. identification of the interrupt level, saving the interrupt vector, performing a jump according to the interrupt table
- b. identification of the interrupt level, performing a jump according to the interrupt table, saving the interrupt vector
- c. identification of the interrupt level, saving the interrupt vector, performing a jump with a trace according to the interrupt table ✓
- d. identification of the interrupt level, performing a jump with the trace according to the interrupt table, saving the interrupt vector

Twoja odpowiedź jest poprawna.

Poprawna odpowiedź to: identification of the interrupt level, saving the interrupt vector, performing a jump with a trace according to the interrupt table

**Pytanie 8**

Poprawnie

Punkty: 3,00 z 3,00

For the disk operation scheduling Cyclic SCAN method, the currently being executed operation is in 30 cylinder. The direction in the Cyclic SCAN method is ascending. The next scheduled operations (in the order of their queuing) are:

Operation number	1	2	3	4	5
Cylinder number	41	24	25	34	40

For the next disk operation, enter the head travel distance (in cylinders) between the current and next operation.

Odpowiedź:  ✓

Poprawna odpowiedź to: 4

**Pytanie 9**

Poprawnie

Punkty: 3,00 z 3,00

When opening a file, we specify the opening mode and the sharing mode.

Let's encode the opening codes:

fmOpenRead	10
fmOpenWrite	01
fmOpenReadWrite	00
fmShareDenyWrite	10
fmShareExclusive	00
fmShareDenyRead	01
fmShareDenyNone	11

The first program opened the file in mode 01 and sharing mode 11

The second program wants to open the file in mode 00 and sharing mode 00

Will the second program be able to open the file (0-no, 1-yes, 2-it depends on other circumstances)?

Odpowiedź:  ✓

Poprawna odpowiedź to: 0

**Pytanie 10**

Poprawnie

Punkty: 3,00 z 3,00

page	M	R	belongs to process
1	0	1	3
2	1	1	3
3	0	0	4
4	1	0	6
5	0	1	2
6	0	1	5
7	1	1	5
8	0	0	5

Using the above table of the history of R bit for the pages in NRU swapping, with global frame allocation rule, which page will be sent to the disk first? The pages are scanned starting from the top. The process for which the frame is needed is 2. Provide a page number.

Odpowiedź: 3 ✓

Poprawna odpowiedź to: 3

**Pytanie 11**

Poprawnie

Punkty: 3,00 z 3,00

In RAID 4, data is placed in Strips that are "scattered" over the data disks, so that each subsequent strip is on the next data disk, modulo the number of disks. For this, there is a parity disk that holds the parity bits of zeroth bits, first bits, second bits, etc., equal-numbered strips divided by the number of data disks, for example, strips 0-3, 4-7, 8-11, etc.:



the start of strips 0,1,2,3 looks like this:

1	1	1	0	0	Parity disk
1	1	1	1	1	Disk 3
1	0	0	1	0	Disk 2
1	0	1	0	1	Disk 1
0	1	1	0	0	Disk 0

In the parity strip, the values are placed so that the parity bit keeps the corresponding strip bits 0-3 even.

Disk 3 has been corrupted and always reads 1. After replacing the disk with a new one, what values should I put in the strip on disk 3?

Enter the values of the consecutive bits on disk 3, without any separators between them, for example 00000

Odpowiedź:  ✓

Poprawna odpowiedź to: 10111

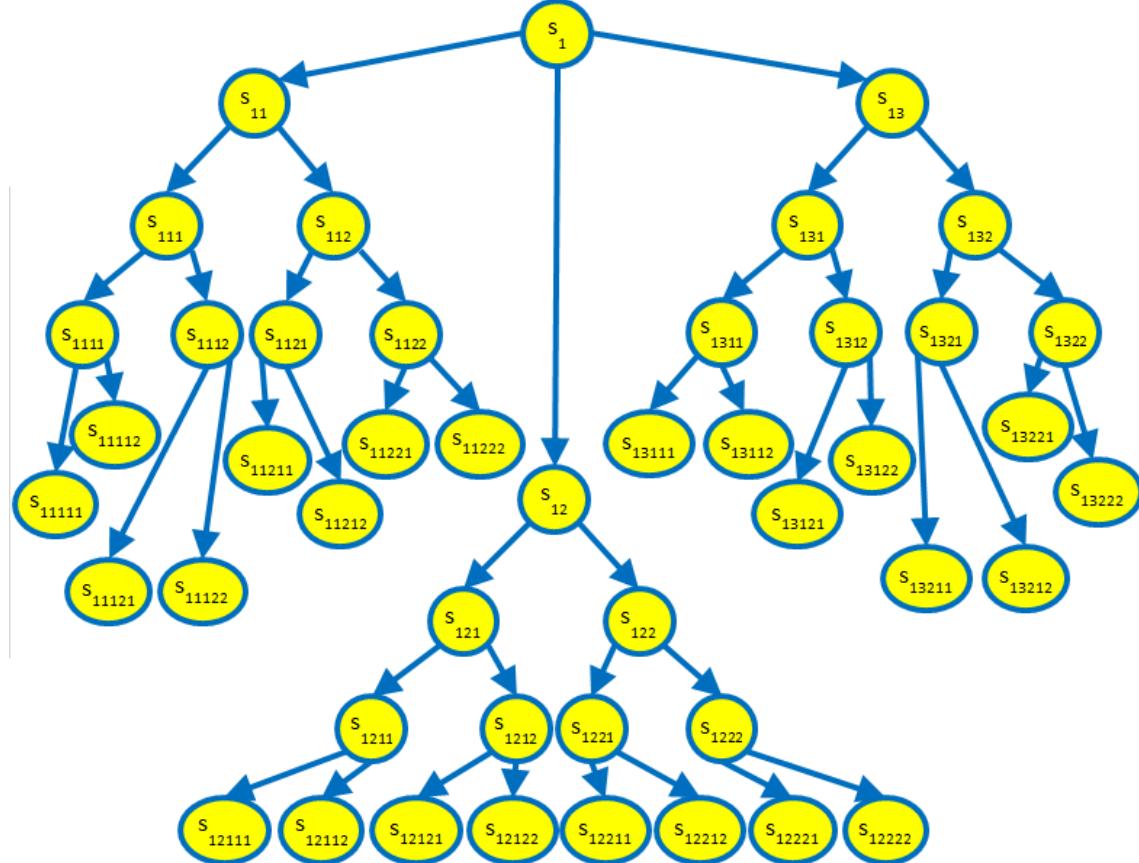
Pytanie 12

Poprawnie

Punkty: 3,00 z 3,00

The stack frame of which subroutine (specify the index) will be pointed by the static link in the frame of the subroutine S1222, that is called from the subroutine S12?

If the call is not possible, enter index -1.



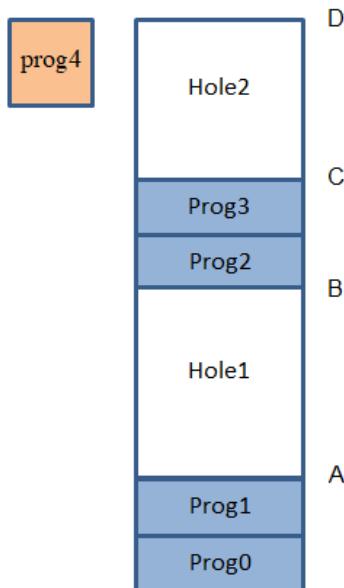
Odpowiedź:  ✓

Poprawna odpowiedź to: -1

**Pytanie 13**

Poprawnie

Punkty: 3,00 z 3,00



In the above memory allocation state, 4 programs are already in memory, and 5th program is waiting to be loaded into the memory. The borders of the holes are:

- A - 4K
- B - 6K
- C - 15K
- D - 17K

The memory is allocated to the programs in the worst-fit rule, without making a new hole if the allocated block is larger than the demand.

What will be the internal fragmentation after loading the program Prog4 of size 2K into memory?

Odpowiedź:

===== for teacher =====

22

Poprawna odpowiedź to: 0

**Pytanie 14**

Poprawnie

Punkty: 3,00 z 3,00

Assuming that memory cells are 1-byte, the page number in the address field is 13 bits, the offset is 13 bits, the frame number is 11 bits, and all entries in the TIS page index table are on a 4-byte word boundary, please specify:

- the maximum size of the physical memory in MB

Odpowiedź:

Poprawna odpowiedź to: 16

**Pytanie 15**

Poprawnie

Punkty: 3,00 z 3,00

We have the tasks with the following priorities in the access to a resource (a larger number is a higher priority):

Process number	1	2	3	4	5	6
Priority	45	44	39	38	42	31

The scheduling policy is preemptive, with the decision time constraint based on time slicing.

The current process is number 4. What process will get the resource in the nearest decision? Provide its priority.

Odpowiedź:

45



Poprawna odpowiedź to: 45

**Pytanie 16**

Poprawnie

Punkty: 3,00 z 3,00

The organization of memory and processor is word-based. A word means 16 bits. (int also takes 1 word) Hexadecimal values are preceded by a # character.

variable a has the value #a0c0

variable b has the value #a0a0

variable c has the value #a0a5

top of the stack (full descending, i.e. the stack pointer points to the most recently put element on the stack, and the stack expands towards lower addresses): #c100

address of subroutine A #1010

stack frame before calling subroutine A #c105

Calling rules: Parameters are put on the stack in accordance with the convention of the C language, i.e. starting from the last one, without a static link, the result of the function is passed in registers. The contents of the stack at label point C. Subroutine A is called A(c,b,a); from address #10a0.

regardless of the programming language, the subroutine header A has the form

A(int x,y,z);

{

    int p = z-y;

    int q = x-y;

C: ...

}

The content of the cell at address #c0fb: dynamic link



Address	content
#c100	????
#c0ff	#a0a5
#c0fe	#a0a0
#c0fd	#a0c0
#c0fc	#10a1
#c0fb	#c105
#c0fa	#0005
#c0f9	#0020
#c0f8	????

Twoja odpowiedź jest poprawna.

Poprawna odpowiedź to:

The organization of memory and processor is word-based. A word means 16 bits. (int also takes 1 word) Hexadecimal values are preceded by a # character.

variable a has the value #a0c0

variable b has the value #a0a0

variable c has the value #a0a5

top of the stack (full descending, i.e. the stack pointer points to the most recently put element on the stack, and the stack expands towards lower addresses): #c100

address of subroutine A #1010

stack frame before calling subroutine A #c105

Calling rules: Parameters are put on the stack in accordance with the convention of the C language, i.e. starting from the last one, without a static link, the result of the function is passed in registers. The contents of the stack at label point C. Subroutine A is called A(c,b,a); from address #10a0.

regardless of the programming language, the subroutine header A has the form

A(int x,y,z);

{

    int p = z-y;

    int q = x-y;

C: ...

}

The content of the cell at address #c0fb:[dynamic link]

Address	content
#c100	????
#c0ff	#a0a5
#c0fe	#a0a0
#c0fd	#a0c0
#c0fc	#10a1
#c0fb	#c105
#c0fa	#0005
#c0f9	#0020
#c0f8	????

**Pytanie 17**

Poprawnie

Punkty: 3,00 z 3,00

page	history of R
0	011000
1	011100
2	010001
3	010110
4	001011
5	001100
6	000011
7	000100

Using the above table of the history of R bit for the pages in LRU swapping, which page will be sent to the disk first? The oldest bit R is on the left. Provide a page number.

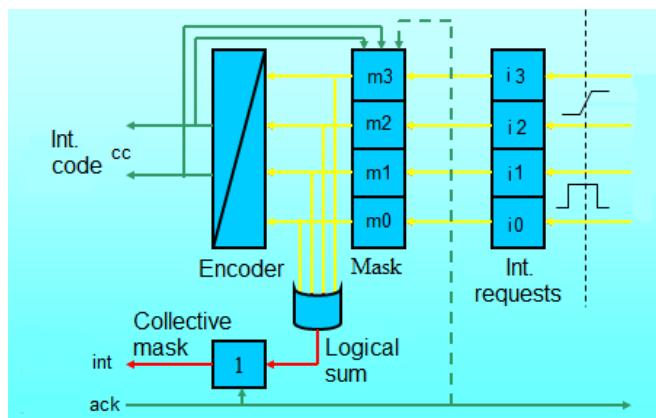
Odpowiedź:  ✓

Poprawna odpowiedź to: 6

**Pytanie 18**

Poprawnie

Punkty: 3,00 z 3,00



In the given interrupt controller structure, the interrupt mask is 1110 (from m3 to m0), and interrupts 0011 (from i3 to i0) are reported.

The interrupt with index 3 has the highest priority.

What will be the value of the interrupt code cc sent to the processor (provide the code in decimal)?

If no interrupt is reported, enter -1

Odpowiedź:  ✓

Poprawna odpowiedź to: 1

<b>Started on</b>	Monday, 16 June 2025, 10:20 AM
<b>State</b>	Finished
<b>Completed on</b>	Monday, 16 June 2025, 11:40 AM
<b>Time taken</b>	1 hour 19 mins
<b>Marks</b>	26.00/40.00
<b>Grade</b>	16.25 out of 25.00 (65%)

**Question 1**

Correct

Mark 1.00 out of 1.00

Interrupt request register is:

Select one or more:

- a. a register where interrupt line states are stored ✓
- b. a register that blocks or unblocks individual interrupts
- c. a register that blocks or unblocks all interrupts
- d. a combinational circuit that calculates the number of the interrupt received

Twoja odpowiedź jest poprawna.

The correct answer is: a register where interrupt line states are stored

**Question 2**

Incorrect

Mark 0.00 out of 1.00

Context switch is caused by:

Select one or more:

- a. input/output operations ✗
- b. relocation
- c. interrupts ✓
- d. paging

Twoja odpowiedź jest niepoprawna.

The correct answer is: interrupts



**Question 3**

Correct

Mark 1.00 out of 1.00

In a concurrent environment, the operating system decides which task the CPU gets, when, and for how long. This feature is called:

- a. task timetable planning
- b. task management
- c. task scheduling ✓
- d. traffic management

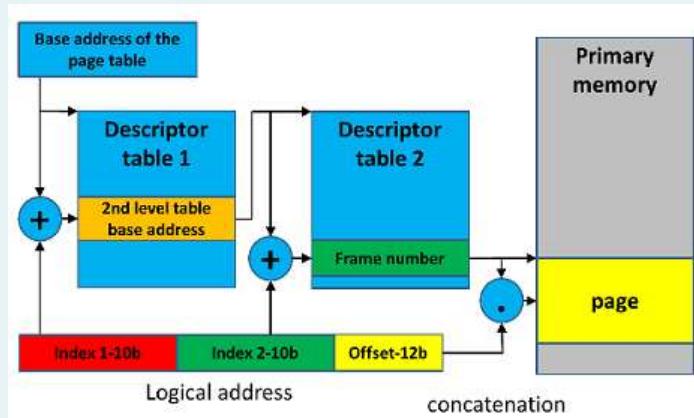
The correct answer is: task scheduling

**Question 4**

Incorrect

Mark 0.00 out of 1.00

Two-level TIS - place frame no:



Select one or more:

- a. in the table of the first level - on the left in the figure
- b. part in the first level table and part in the second level table
- c. none of the above answers
- d. in the table of the second level - on the right in the figure ✗

Twoja odpowiedź jest niepoprawna.

The correct answer is:

none of the above answers



**Question 5**

Correct

Mark 1.00 out of 1.00

Paging is in thrashing if:

- a. page cannot be swapped
- b. the system spends less time paging than execution
- c. the system spends more time paging than execution ✓
- d. page faults occur

The correct answer is: the system spends more time paging than execution

**Question 6**

Correct

Mark 1.00 out of 1.00

What does the file system layer do?

- a. Manages remote file systems
- b. Manages relationships between files
- c. Manages directories ✓
- d. Manages remote files
- e. Manages free storage space ✓

The correct answers are: Manages directories, Manages free storage space

**Question 7**

Correct

Mark 1.00 out of 1.00

For concurrency in OS:

- a. interrupt handling is necessary ✓
- b. timer interrupts are necessary
- c. special processor support is required
- d. cache memory is necessary

The correct answer is: interrupt handling is necessary



**Question 8**

Correct

Mark 3.00 out of 3.00

For the disk operation scheduling SCAN method, the currently being executed operation is in 40 cylinder. The direction in the SCAN method is ascending. The next scheduled operations (in the order of their queuing) are:

Operation number	1	2	3	4	5
Cylinder number	51	32	39	44	48

After which disk operation the current scan direction will change? Provide the cylinder number of the operation after which the direction will change.

Answer:  

The correct answer is: 51

**Question 9**

Correct

Mark 3.00 out of 3.00

When opening a file, we specify the opening mode and the sharing mode.

Let's encode the opening codes:

fmOpenRead	10
fmOpenWrite	01
fmOpenReadWrite	00
fmShareDenyWrite	10
fmShareExclusive	00
fmShareDenyRead	01
fmShareDenyNone	11



The first program opened the file in mode 10 and sharing mode 10

The second program wants to open the file in mode 00 and sharing mode 00

Will the second program be able to open the file (0-no, 1-yes, 2-it depends on other circumstances)?

Answer:  

The correct answer is: 0

**Question 10**

Incorrect

Mark 0.00 out of 3.00

page	Last used	Bit R	belongs to process
1	89	1	4
2	90	0	4
3	91	0	2
4	92	0	3
5	93	1	2
6	94	1	3
7	95	0	2
8	96	1	4

Using the above table of the history of R bit for the pages in Workset swapping algorithm, with priority frame allocation method, which page will be sent to the disk first? The current time slice number is 97, and the time range  $\tau$  for the workset is 5 (the threshold  $97-\tau=92$ ). Page scan starts from the top. The current process that needs a page to be loaded is 4. A process number is its priority (the smaller number, the higher priority). Provide a page number to be sent to the disk.

Answer:  

The correct answer is: 2

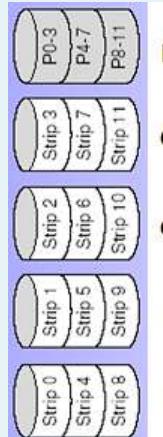


**Question 11**

Incorrect

Mark 0.00 out of 3.00

In RAID 4, data is placed in Strips that are "scattered" over the data disks, so that each subsequent strip is on the next data disk, modulo the number of disks. For this, there is a parity disk that holds the parity bits of zeroth bits, first bits, second bits, etc., equal-numbered strips divided by the number of data disks, for example, strips 0-3, 4-7, 8-11, etc.:

**parity disk****disk 3****disk 2****disk 1****disk 0**

the start of strips 0,1,2,3 looks like this:

1	1	1	0	0	Parity disk
0	0	0	0	0	Disk 3
1	0	0	1	0	Disk 2
1	0	1	0	1	Disk 1
0	1	1	0	0	Disk 0

In the parity strip, the values are placed so that the parity bit keeps the corresponding strip bits 0-3 even.

Disk 3 has been damaged and reads only 0. After replacing the disk with a new one, what values should be put in the strip on disk 3?

Enter the values of the consecutive bits on disk 3, without any separators between them, for example 00000

Answer:  ×

The correct answer is: 10111

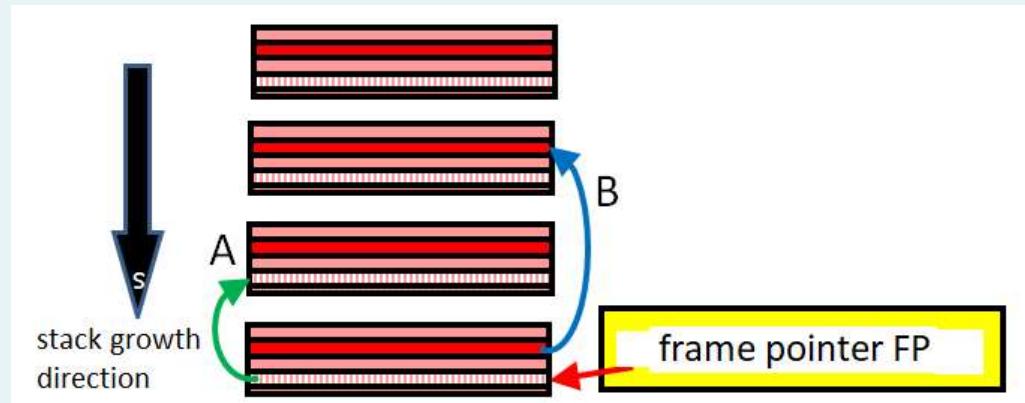


**Question 12**

Correct

Mark 3.00 out of 3.00

In the shown "snapshot" of the program stack, the static link (A) and the dynamic link (B) are shown. The subroutine pointed by B is the "parent" of the subroutine at the top of the stack in the hierarchy. Could the subroutine on top of the stack be called recursively?

 True ✓ False

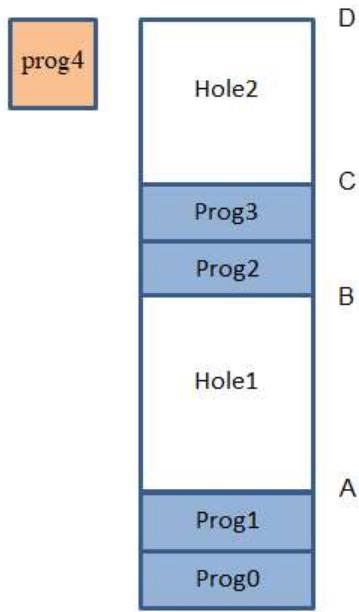
The correct answer is 'True'.



**Question 13**

Incorrect

Mark 0.00 out of 3.00



In the above memory allocation state, 4 programs are already in memory, and 5th program is waiting to be loaded into the memory. The borders of the holes are:

- A - 2K
- B - 6K
- C - 12K
- D - 17K

The memory is allocated to the programs in the worst-fit rule, without making a new hole if the allocated block is larger than the demand.

What will be the internal fragmentation after loading the program Prog4 of size 1K into memory?

Answer:  ✖

===== for teacher =====

4 5

The correct answer is: 4



**Question 14**

Correct

Mark 3.00 out of 3.00

Assuming that the instruction is 32 bits, the data accessed in the instructions are 2, 4 or 8 bytes, the memory access addressing is on the word (2-byte) boundary, and the page size is 4kB, one instruction can cause the following number of exceptions "page fault":

Answer: 4



The correct answer is: 4

**Question 15**

Correct

Mark 3.00 out of 3.00

What is the average time in the system for tasks in the batch incoming in this order, using FCFS algorithm?

The system is equipped with 4 processors

task	1	2	3	4
processing time	3.6	4.6	2.4	1.2

Answer: 2.95



The correct answer is: 2.9



**Question 16**

Correct

Mark 3.00 out of 3.00

The organization of memory and processor is word-based. A word means 16 bits (int also takes 1 16-bit word). Hexadecimal values are preceded by a # character.

variable a has the value #a0c0

top of the stack (full descending, i.e. the stack pointer points to the most recently put element on the stack, and the stack expands towards lower addresses) #c100

stack frame before subroutine B call #c1010

address of subroutine B #1021

Calling rules: Parameters are put on the stack in accordance with the convention of the C language, i.e. starting from the last one, without a static connection, the result of the function is passed in registers. The stack is shown after subroutine B is called by itself (recursively), at label point C. Subroutine B is called for the first time B(a-2); somewhere in the program from address #1011. Label C has address #1050.

regardless of the programming language, subroutine B has the form

B(int i);

{

    int p=i+1;

    C:     B(i-3);

}

The content of the cell at address #c0f9:  

Address	content
#c100	????
#c0ff	#a0be
#c0fe	#1012
#c0fd	#c010
#c0fc	#a0bf
#c0fb	#a0bb
#c0fa	#1051
#c0f9	#c0fd
#c0f8	#a0bc
#c0f7	????
#c0f6	????



Twoja odpowiedź jest poprawna.

The correct answer is:

The organization of memory and processor is word-based. A word means 16 bits (int also takes 1 16-bit word). Hexadecimal values are preceded by a # character.

variable a has the value #a0c0

top of the stack (full descending, i.e. the stack pointer points to the most recently put element on the stack, and the stack expands towards lower addresses) #c100

stack frame before subroutine B call #c1010

address of subroutine B #1021

Calling rules: Parameters are put on the stack in accordance with the convention of the C language, i.e. starting from the last one, without a static connection, the result of the function is passed in registers. The stack is shown after subroutine B is called by itself (recursively), at label point C. Subroutine B is called for the first time B(a-2); somewhere in the program from address #1011. Label C has address #1050.

regardless of the programming language, subroutine B has the form

```
B(int i);
{
    int p=i+1;
    C:    B(i-3);
}
```

The content of the cell at address #c0f9:[dynamic link]

Address	content
#c100	????
#c0ff	#a0be
#c0fe	#1012
#c0fd	#c010
#c0fc	#a0bf
#c0fb	#a0bb
#c0fa	#1051
#c0f9	#c0fd
#c0f8	#a0bc
#c0f7	????
#c0f6	????

### Question 17

Incorrect

Mark 0.00 out of 3.00

page nr	1	2	3	4	5	6	7	8	9
loaded	2	7	15	23	25	35	53	60	62
R bit	0	1	0	1	1	1	1	1	0

Using the above list for the FIFO-second chance swapping algorithm, which page will be sent to the disk first? The middle row is the number of a time slice in which a page was loaded to a frame. Provide a page number.

Answer:  ×

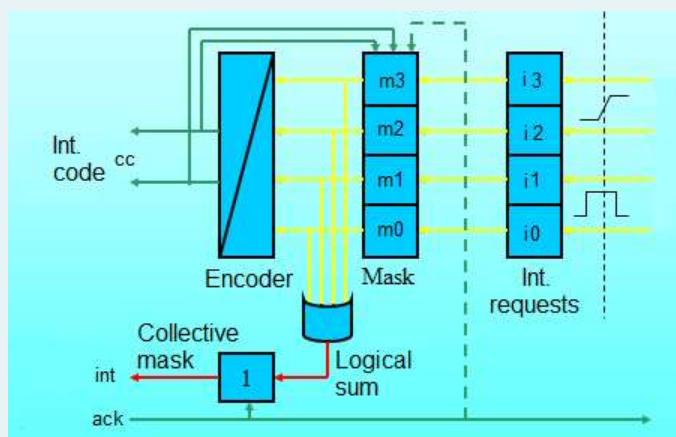


The correct answer is: 1

**Question 18**

Correct

Mark 3.00 out of 3.00



In the given interrupt controller structure, the interrupt mask is 1100 (from m3 to m0), and interrupts 0011 (from i3 to i0) are reported.

The interrupt with index 3 has the highest priority.

What will be the value of the interrupt code cc sent to the processor (provide the code in decimal)?

If no interrupt is reported, enter -1

Answer:

The correct answer is: -1



<b>Started on</b>	Monday, 16 June 2025, 10:52 AM
<b>State</b>	Finished
<b>Completed on</b>	Monday, 16 June 2025, 11:46 AM
<b>Time taken</b>	54 mins 7 secs
<b>Marks</b>	36.00/40.00
<b>Grade</b>	22.50 out of 25.00 (90%)

**Question 1**

Correct

Mark 1.00 out of 1.00

For concurrency in OS:

- a. interrupt handling is necessary ✓
- b. special processor support is required
- c. timer interrupts are necessary
- d. cache memory is necessary

The correct answer is: interrupt handling is necessary

**Question 2**

Incorrect

Mark 0.00 out of 1.00

The following paging exceptions allow for returning to the program after they occur:

Select one or more:

- a. page fault ✓
- b. attempting to write to a write-protected frame
- c. interrupt on write (IOW) ✓
- d. attempt to read from the frame storing the code ✗

Twoja odpowiedź jest niepoprawna.

The correct answers are: page fault, interrupt on write (IOW)

**Question 3**

Correct

Mark 1.00 out of 1.00

The return from interrupt instruction:

Select one or more:

- a. causes the processor to switch to a process other than the interrupted one
- b. restores the program counter ✓
- c. restores the process stack
- d. restores the conditions register ✓

Twoja odpowiedź jest poprawna.

The correct answers are: restores the program counter, restores the conditions register

**Question 4**

Correct

Mark 1.00 out of 1.00

What mechanism is used to save and restore the task state?

- a. task descriptor
- b. scheduling data
- c. applications counter
- d. context switch ✓

The correct answer is: context switch

**Question 5**

Correct

Mark 1.00 out of 1.00

Imprecise interrupts can be handled:

Select one or more:

- a. only when the program allows accepting interrupts
- b. when new instructions are suspended to be fetched into the pipeline
- c. after saving the full state of the pipeline ✓
- d. after clearing the pipeline from the instructions ✓

Twoja odpowiedź jest poprawna.

The correct answers are: after clearing the pipeline from the instructions, after saving the full state of the pipeline

**Question 6**

Correct

Mark 1.00 out of 1.00

Inter-process communication can be organized using:

Select one or more:

- a. interrupts
- b. shared memory fields accessible through system calls ✓
- c. messages ✓
- d. shared directly addressable memory fields ✓

Twoja odpowiedź jest poprawna.

The correct answers are: messages, shared directly addressable memory fields, shared memory fields accessible through system calls

**Question 7**

Correct

Mark 1.00 out of 1.00

A concurrent system is one that, in principle:

Select one or more:

- a. It runs on a multiprocessor computer
- b. Requires the use of timer interrupts
- c. It allows multiple programs/processes/threads to run physically simultaneously
- d. Allows multiple programs/processes/threads to run simultaneously or seemingly simultaneously



Twoja odpowiedź jest poprawna.

The correct answer is: Allows multiple programs/processes/threads to run simultaneously or seemingly simultaneously

**Question 8**

Correct

Mark 3.00 out of 3.00

For the disk operation scheduling SCAN method, the currently being executed operation is in 33 cylinder.

The direction in the SCAN method is ascending. The next scheduled operations (in the order of their queuing) are:

Operation number	1	2	3	4	5
Cylinder number	42	25	28	37	41

After which disk operation the current scan direction will change? Provide the cylinder number of the operation after which the direction will change.

Answer: 42



The correct answer is: 42

**Question 9**

Correct

Mark 3.00 out of 3.00

When opening a file, we specify the opening mode and the sharing mode.

Let us encode the opening codes:

fmOpenRead	10
fmOpenWrite	01
fmOpenReadWrite	00
fmShareDenyWrite	10
fmShareExclusive	00
fmShareDenyRead	01
fmShareDenyNone	11

The first program opened the file in mode 00 and sharing mode 10

The second program wants to open the file in mode 01 and sharing mode 11

Will the second program be able to open the file (0-no, 1-yes, 2-it depends on other circumstances)?

Answer:

 0

The correct answer is: 0

**Question 10**

Correct

Mark 3.00 out of 3.00

page	M	R	belongs to process
1	1	1	5
2	0	1	3
3	1	0	4
4	0	0	4
5	1	1	5
6	1	1	3
7	0	1	4
8	1	0	5

Using the above table of bits M and R for the pages in NRU swapping, with the priority frame allocation rule, which page will be sent to the disk first? The pages are scanned starting from the top. A process number is its priority (the smaller number, the higher priority). The process for which the frame is needed is 4. Provide a page number.

Answer: 4 ✓

The correct answer is: 4

**Question 11**

Correct

Mark 3.00 out of 3.00

In RAID 4, data is placed in Strips that are "scattered" over the data disks, so that each subsequent strip is on the next data disk, modulo the number of disks. For this, there is a parity disk that holds the parity bits of zeroth bits, first bits, second bits, etc., equal-numbered strips divided by the number of data disks, for example, strips 0-3, 4-7, 8-11, etc.:



the start of strips 0,1,2,3 looks like this:

0	1	0	0	1	Parity disk
0	0	0	0	0	Disk 3
1	0	1	1	0	Disk 2
1	1	0	0	1	Disk 1
0	1	1	0	0	Disk 0

In the parity strip, the values are placed so that the parity bit keeps the corresponding strip bits 0-3 odd.

Disk 3 has been damaged and reads only 0. After replacing the disk with a new one, what values should be put in the strip on disk 3?

Enter the values of the consecutive bits on disk 3, without any separators between them, for example  
00000

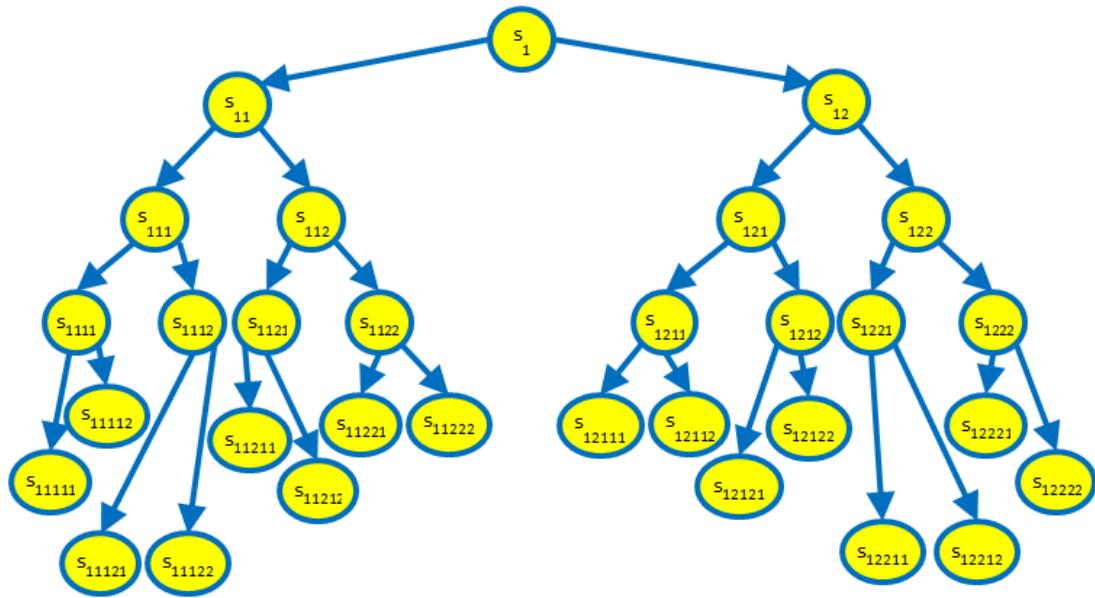
Answer:

The correct answer is: 10101

**Question 12**

Correct

Mark 3.00 out of 3.00



Above is the nesting structure of subroutines in some program.

Can there be a static link in subroutine s12 stack frame to subroutine s122 frame?

answer: 0-no, 1-yes

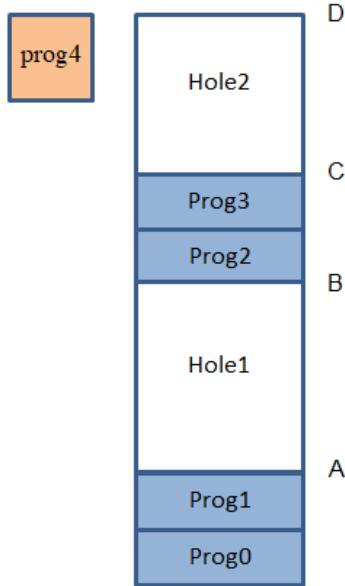
Answer:  ✓

The correct answer is: 0

**Question 13**

Correct

Mark 3.00 out of 3.00



In the above memory allocation state, 4 programs are already in memory, and 5th program is waiting to be loaded into the memory. The borders of the holes are:

- A - 2K
- B - 3K
- C - 12K
- D - 19K

The memory is allocated to the programs in the first-fit rule, without making a new hole if the allocated block is larger than the demand. The memory is scanned for the fitting hole starting from the lower addresses.

What will be the internal fragmentation after loading the program Prog4 of size 5K into memory?

Answer: 2 ✓

===== for teacher =====

1 7

The correct answer is: 2

**Question 14**

Correct

Mark 3.00 out of 3.00

The virtual address consists of 7b page number and 9b offset. The page index table is shown below (index, content). For decimal address 2704, binary 0000 1010 1001 0000, enter the physical address in the form: frame number.offset (as decimal numbers, offset to 3 digits). For example, for a physical address consisting of frame 0 and offset 18, specify 0.018. If there is no physical address for the given virtual address, then -1 should be specified.

7	4
6	5
5	-1
4	11
3	6
2	9
1	-1
0	1

Answer: -1 ✓

The correct answer is: -1.000

**Question 15**

Correct

Mark 3.00 out of 3.00

What is the average time in the system for tasks in the batch, using SJF algorithm?

The system is equipped with 4 processors

task	1	2	3	4
processing time	3.6	5.6	2.8	1.7

Answer: 3.425 ✓

The correct answer is: 3.4

**Question 16**

Incorrect

Mark 0.00 out of 3.00

The stack is full descending, that is, the stack pointer points to the most recently put element on the stack, and the stack expands towards lower addresses. Memory is byte-organized (individual bytes are addressed). Every piece of data occupies 4 bytes (also, memory cells and general-purpose registers).

Parameters are pushed on the stack by C convention, starting with the last one. The static link is pushed on the stack after the parameters. The subroutine has local variables: 4, which occupy 1 memory cell each.

After calling the subroutine with parameters: 3, occupying 1 memory cell each, the static link will be at the address relative to the SP (decimal number should be entered):

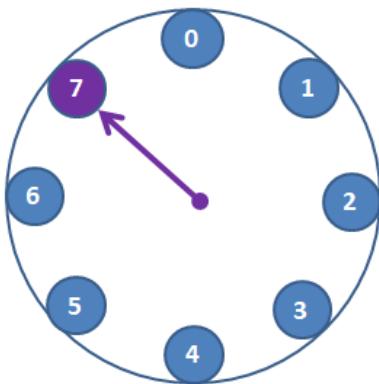
Answer: 28 ✖

The correct answer is: 24

**Question 17**

Correct

Mark 3.00 out of 3.00



page	3	4	5	6	7	0	1	2
R bit	1	1	1	1	1	1	1	1

Using the above list for the Clock swapping algorithm, which page will be sent to the disk first? Provide a page number.

The current position of the "arrow" is 3 (regardless of the position in the picture), and the algorithm works clockwise.

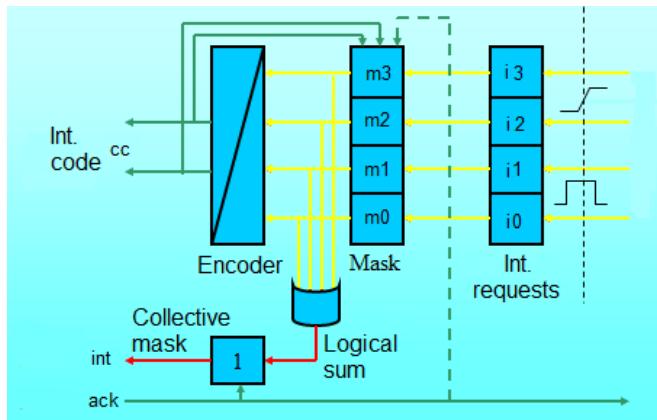
Answer: 3 ✓

The correct answer is: 3

**Question 18**

Correct

Mark 3.00 out of 3.00



In the given interrupt controller structure, the interrupt mask is 1111 (from m3 to m0), and interrupts 0010 (from i3 to i0) are reported.

The interrupt with index 3 has the highest priority.

What will be the new value of the interrupt mask? Provide the bits .m3m2m1m0 (mask preceded by a point) for example .0101

Answer:  ✓

The correct answer is: 0.1100

<b>It has started</b>	Monday, June 16, 2025, 10:23 AM
<b>Condition</b>	Completed
<b>Completed</b>	Monday, June 16, 2025, 11:41 AM
<b>Time used</b>	1 hour 17 minutes
<b>Points</b>	34.50/40.00
<b>Rate</b>	21.56 points out of 25.00 points possible to obtain ( 86.25 %)

**Question 1**

Correctly

Points: 1.00 out of 1.00

The following situations trigger "error" exceptions:

Select all correct:

- a. memory reference beyond limit register value ✓
- b. memory reference in the area of the page that is not in memory
- c. a reference to memory that is not in the program address space ✓
- d. an attempt to execute an instruction from the area of the page for which the "no code" bit was set ✓

Your answer is correct.

The correct answers are: a reference to memory that is not in the program address space, memory reference beyond limit register value, an attempt to execute an instruction from the area of the page for which the "no code" bit was set

**Question 2**

Correctly

Points: 1.00 out of 1.00

At the ready state is a process that:

Select all correct:

- a. waits for a processor ✓
- b. occupies a processor
- c. waits for an I/O operation to complete
- d. fills the processor idle time

Your answer is correct.

The correct answer is: waits for a processor

**Question 3**

Correctly

Points: 1.00 out of 1.00

Cloning a process with a *fork* operation results in (not taking to account the numerical result of *fork*):

Select all correct:

- a. Duplication of data segment and stack segment ✓
- b. Duplication of code segment, initialization of new data segment and stack segment
- c. Duplication of code, data and stack segments

Your answer is correct.

The correct answer is: Duplication of data segment and stack segment

**Question 4**

Incorrectly

Points: 0.00 out of 1.00

The virtualizer that takes over the guest application system call extracodes and transfers them to the host system for execution (adjusting the call parameters accordingly), it can be:

Select all correct:

- a. paravirtualizer
- b. full virtualizer
- c. emulator ✗
- d. API virtualizer ✓

Your answer is incorrect.

The correct answer is: API virtualizer

**Question 5**

Correctly

Points: 1.00 out of 1.00

What mechanism is used to save and restore the task state?

- a. task descriptor
- b. context switch ✓
- c. applications counter
- d. scheduling data

Poprawna odpowiedź to: context switch

**Pytanie 6**

Niepoprawnie

Punkty: 0,00 z 1,00

Nested page index tables require activity during:

references



Twoja odpowiedź jest niepoprawna.

Poprawna odpowiedź to:

Nested page index tables require activity during:

[swapping]

**Pytanie 7**

Częściowo poprawnie

Punkty: 0,50 z 1,00

Dynamic relocation is performed by:

- a. Compiler
- b. Linker
- c. Paging system
- d. Segment descriptors ✓

Prawidłowymi odpowiedziami są: Paging system, Segment descriptors

**Pytanie 8**

Poprawnie

Punkty: 3,00 z 3,00

For the disk operation scheduling SCAN method, the currently being executed operation is in 40 cylinder. The direction in the SCAN method is ascending. The next scheduled operations (in the order of their queuing) are:

Operation number	1	2	3	4	5
Cylinder number	51	32	39	44	48

For the next disk operation, enter the head travel distance (in cylinders) between the current and next operation.

Odpowiedź:

4



Poprawna odpowiedź to: 4

**Pytanie 9**

Poprawnie

Punkty: 3,00 z 3,00

When opening a file, we specify the opening mode and the sharing mode.

Let's encode the opening codes:

fmOpenRead	10
fmOpenWrite	01
fmOpenReadWrite	00
fmShareDenyWrite	10
fmShareExclusive	00
fmShareDenyRead	01
fmShareDenyNone	11

The first program opened the file in mode 01 and sharing mode 00

The second program wants to open the file in mode 01 and sharing mode 01

Will the second program be able to open the file (0-no, 1-yes, 2-it depends on other circumstances)?

Odpowiedź:

Poprawna odpowiedź to: 0

**Pytanie 10**

Poprawnie

Punkty: 3,00 z 3,00

page	Last used	Bit R	belongs to process
1	91	0	3
2	92	1	5
3	89	1	4
4	90	1	5
5	95	0	5
6	96	0	4
7	93	1	4
8	94	0	4

Using the above table of the history of R bit for the pages in Workset swapping algorithm, with local frame allocation method, which page will be sent to the disk first? The current time slice number is 97, and the time range  $\tau$  for the workset is 3 (the threshold  $97-\tau=94$ ). Page scan starts from the top. The current process that needs a page to be loaded is 3. A process number is its priority (the smaller number, the higher priority). Provide a page number to be sent to the disk.

Odpowiedź:

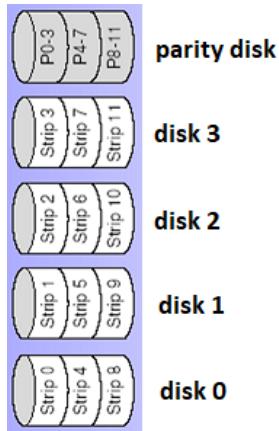
Poprawna odpowiedź to: 1

**Pytanie 11**

Poprawnie

Punkty: 3,00 z 3,00

In RAID 4, data is placed in Strips that are "scattered" over the data disks, so that each subsequent strip is on the next data disk, modulo the number of disks. For this, there is a parity disk that holds the parity bits of zeroth bits, first bits, second bits, etc., equal-numbered strips divided by the number of data disks, for example, strips 0-3, 4-7, 8-11, etc.:



the start of strips 0,1,2,3 looks like this:

1	1	1	0	0	Parity disk
1	1	1	1	1	Disk 3
1	0	0	1	0	Disk 2
1	0	1	0	1	Disk 1
0	1	1	0	0	Disk 0

In the parity strip, the values are placed so that the parity bit keeps the corresponding strip bits 0-3 even.

Disk 3 has been corrupted and always reads 1. After replacing the disk with a new one, what values should I put in the strip on disk 3?

Enter the values of the consecutive bits on disk 3, without any separators between them, for example 00000

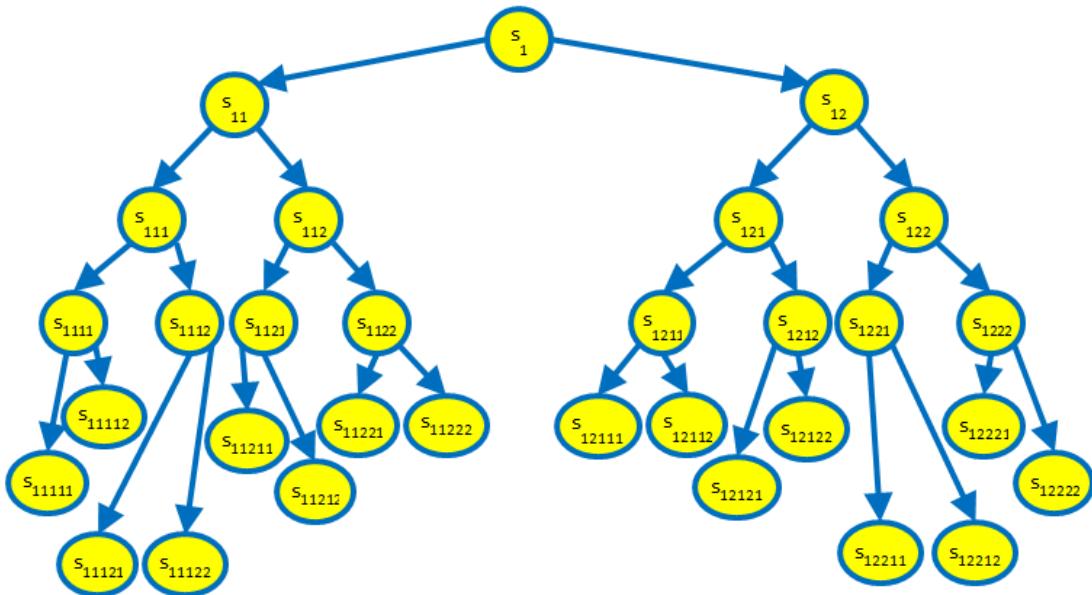
Odpowiedź:  ✓

Poprawna odpowiedź to: 10111

**Pytanie 12**

Poprawnie

Punkty: 3,00 z 3,00



Above is the nesting structure of subroutines in some program.

Can there be a static link in subroutine s121 stack frame to subroutine s12 frame?

answer: 0-no, 1-yes

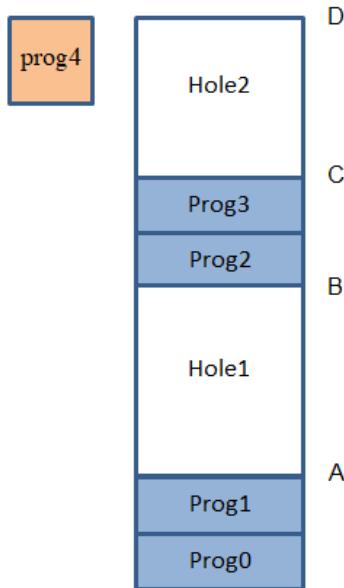
Odpowiedź:  ✓

Poprawna odpowiedź to: 1

**Pytanie 13**

Poprawnie

Punkty: 3,00 z 3,00



In the above memory allocation state, 4 programs are already in memory, and 5th program is waiting to be loaded into the memory. The borders of the holes are:

- A - 3K
- B - 7K
- C - 12K
- D - 14K

The memory is allocated to the programs in the best-fit rule, without making a new hole if the allocated block is larger than the demand.

What will be the internal fragmentation after loading the program Prog4 of size 2K into memory?

Odpowiedź:

===== for teacher =====

4 2

Poprawna odpowiedź to: 0

**Pytanie 14**

Poprawnie

Punkty: 3,00 z 3,00

The virtual address consists of 8b page number and 8b offset. The page index table is shown below (index, content). For decimal address 1840, binary 0000 0111 0011 0000, enter the physical address in the form: frame number.offset (as decimal numbers, offset in 3 digits). For example, for a physical address consisting of frame 0 and offset 18, specify 0.018. If there is no physical address for the given virtual address, then -1 should be specified.

7	4
6	-1
5	7
4	11
3	6
2	-1
1	2
0	1

Odpowiedź: 4.048 ✓

Poprawna odpowiedź to: 4,048

**Pytanie 15**

Poprawnie

Punkty: 3,00 z 3,00

What is the average time in the system for tasks in the batch incoming in this order, using FCFS algorithm?

task	1	2	3	4
processing time	3,1	6,7	2,8	1,1

Odpowiedź: 9,8 ✓

Poprawna odpowiedź to: 9,8

**Pytanie 16**

Poprawnie

Punkty: 3,00 z 3,00

The organization of memory and processor is word-based. A word means 16 bits (int also takes 1 16-bit word). Hexadecimal values are preceded by a # character.

variable a has the value #a0c0

top of the stack (full descending, i.e. the stack pointer points to the most recently put element on the stack, and the stack expands towards lower addresses) #c100

stack frame before subroutine B call #c1010

address of subroutine B #1021

Calling rules: Parameters are put on the stack in accordance with the convention of the C language, i.e. starting from the last one, without a static connection, the result of the function is passed in registers. The stack is shown after subroutine B is called by itself (recursively), at label point C. Subroutine B is called for the first time B(a-2); somewhere in the program from address #1011. Label C has address #1050.

regardless of the programming language, subroutine B has the form

B(int i);

{

    int p=i+1;

    C:     B(i-3);

}

The content of the cell at address #c0f9: dynamic link ✓

Address	content
#c100	????
#c0ff	#a0be
#c0fe	#1012
#c0fd	#c010
#c0fc	#a0bf
#c0fb	#a0bb
#c0fa	#1051
#c0f9	#c0fd
#c0f8	#a0bc
#c0f7	????
#c0f6	????

Twoja odpowiedź jest poprawna.

The correct answer is:

The organization of memory and processor is word-based. A word means 16 bits (int also takes 1 16-bit word). Hexadecimal values are preceded by a # character.

variable a has the value #a0c0

top of the stack (full descending, i.e. the stack pointer points to the most recently put element on the stack, and the stack expands towards lower addresses) #c100

stack frame before subroutine B call #c1010

address of subroutine B #1021

**Calling rules:** Parameters are put on the stack in accordance with the convention of the C language, i.e. starting from the last one, without a static connection, the result of the function is passed in registers. The stack is shown after subroutine B is called by itself (recursively), at label point C. Subroutine B is called for the first time B(a-2); somewhere in the program from address #1011. Label C has address #1050.

regardless of the programming language, subroutine B has the form

```
B(int i);
{
    int p=i+1;
    C: B(i-3);
}
```

The content of the cell at address #c0f9:[dynamic link]

Address	content
#c100	????
#c0ff	#a0be
#c0fe	#1012
#c0fd	#c010
#c0fc	#a0bf
#c0fb	#a0bb
#c0fa	#1051
#c0f9	#c0fd
#c0f8	#a0bc
#c0f7	????
#c0f6	????

### Question 17

Correctly

Points: 3.00 out of 3.00

page	history of R
0	101100100
1	0000010001
2	011011111
3	110110100

Using the above table of the history of R bit for the pages in LFU swapping, which page will be sent to the disk first? The oldest bit R is on the left. Provide a page number.

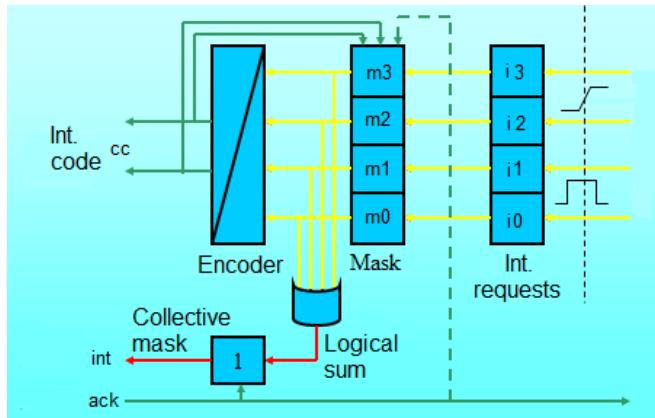
Answer:  ✓

The correct answer is: 1

**Question 18**

Incorrectly

Points: 0.00 out of 3.00



In the given interrupt controller structure, the interrupt mask is 1111 (from m3 to m0), and interrupts 0010 (from i3 to i0) are reported.

The interrupt with index 3 has the highest priority.

What will be the new value of the interrupt mask? Provide the bits .m3m2m1m0 (mask preceded by a point) for example .0101

Answer: 1101 X

The correct answer is: 0.1100

WORST-FIT algorithm:

Question 1 Select one or more:

- a.  
Requires sorting the cut part into the list of free blocks
- b.  
It is designed to reduce external fragmentation
- c.  
It allows for fast determining whether there is a free block of the required size
- d.  
Requires a descending sort of the list of free blocks

**Feedback**

Twoja odpowiedź jest częściowo poprawna.

You have correctly selected 2.

The correct answers are: Requires a descending sort of the list of free blocks, It allows for fast determining whether there is a free block of the required size, It is designed to reduce external fragmentation, Requires sorting the cut part into the list of free blocks

Question 2

Incorrect

Mark 0.00 out of 1.00

[Flag question](#)

**Question text**

The hardware mechanisms necessary for paging are ("frame error" also called "page fault", "frame miss"):

Question 2 Select one or more:

- a.  
address translation, page index tables, "frame error" interrupt
- b.  
address translation, page index tables, page reference bits, "frame error" interrupt
- c.  
address translation, page index tables, "frame error" interrupt, associative memory, page swapper
- d.  
address translation, page index tables, page reference bits, "frame error" interrupt, associative memory

**Feedback**

Twoja odpowiedź jest niepoprawna.

The correct answer is: address translation, page index tables, "frame error" interrupt

Question 3

Incorrect

Mark 0.00 out of 1.00

Flag question

**Question text**

For address translation, the following is used:

Question 3Select one or more:

- a.  
translation register
- b.  
reference and protection bits
- c.  
index table
- d.  
associative translation buffer

**Feedback**

Twoja odpowiedź jest niepoprawna.

The correct answers are: index table, associative translation buffer

**Question 4**

Correct

Mark 1.00 out of 1.00

Flag question

**Question text**

The hardware resources of a computer system are:

Question 4Select one or more:

- a.  
Virtual memory
- b.  
Peripheral devices
- c.  
Processor time
- d.  
Windows on the screen

**Feedback**

Twoja odpowiedź jest poprawna.

The correct answers are: Processor time, Peripheral devices

**Question 5**

Correct

Mark 1.00 out of 1.00

Flag question

**Question text**

The following paging exceptions allow for returning to the program after they occur:

Question 5 Select one or more:

- a. interrupt on write (IOW)
- b. attempting to write to a write-protected frame
- c. attempt to read from the frame storing the code
- d. page fault

**Feedback**

Twoja odpowiedź jest poprawna.

The correct answers are: page fault, interrupt on write (IOW)

Question 6

Correct

Mark 1.00 out of 1.00

Flag question

**Question text**

The content of the last (lowest in the hierarchy) page index table is:

Answer: Question 6

**Feedback**

The correct answer is: frame

Question 7

Correct

Mark 1.00 out of 1.00

Flag question

**Question text**

Using the Test-And-Set instruction in synchronization:

Question 7 Select one or more:

- a. It requires processes to actively wait
- b. Stops the processor if 0 is read
- c. Requires the use of semaphores
- d. Requires organizing inactive waiting in queues

**Feedback**

Twoja odpowiedź jest poprawna.

The correct answer is: It requires processes to actively wait

**Question 8**

Incorrect

Mark 0.00 out of 1.00

[Flag question](#)

**Question text**

On UNIX, the number of files is directly limited by:

Question 8 Select one or more:

- a.  
The size of the space allocated for files
- b.  
Allocation unit size
- c.  
The number of bits of the field describing the size of the file
- d.  
FAT size
- e.  
The number of bits of the disk address

**Feedback**

Twoja odpowiedź jest niepoprawna.

The correct answer is: The size of the space allocated for files

**Question 9**

Incorrect

Mark 0.00 out of 1.00

[Flag question](#)

**Question text**

Having two-level page index tables:

Question 9 Select one or more:

- a.  
the content of the level I table element is concatenated (combined) with the content of the level II table element
- b.  
the content of a level I table element is added to the content of a level II table element
- c.  
the content of a level I table element points to a level II table
- d.  
the content of a level I table element is an index in a level II table

### Feedback

Twoja odpowiedź jest niepoprawna.

The correct answer is: the content of a level I table element points to a level II table

### Question 10

Incorrect

Mark 0.00 out of 1.00

[Flag question](#)

### Question text

Which swapping algorithms use information about a reference to pages in the last k periods of time?

Question 10Select one or more:

- a. FIFO
- b. working set clock
- c. optimal
- d. working set
- e. LRU
- f. drugiej szansy
- g. LFU
- h. no algorithm
- i. NRU

### Feedback

Twoja odpowiedź jest niepoprawna.

The correct answers are: working set, working set clock

### Question 11

Correct

Mark 1.00 out of 1.00

[Flag question](#)

### Question text

When a suspended program is moved to auxiliary memory, its process state is called:

Question 11Answer

- a.  
rinsed out
- b.  
swept away
- c.  
exchanged
- d.  
moved out

#### Feedback

The correct answer is: swept away

#### Question 12

Correct

Mark 1.00 out of 1.00

Flag question

#### Question text

The common allocation queue to fixed blocks of memory of equal size causes:

Question 12Select one or more:

- a.  
need for compaction
- b.  
external fragmentation
- c.  
internal fragmentation

#### Feedback

Twoja odpowiedź jest poprawna.

The correct answer is: internal fragmentation

#### Question 13

Incorrect

Mark 0.00 out of 1.00

Flag question

#### Question text

The effective address is also:

Question 13Select one or more:

- a.  
Indirect address
- b.  
Absolute address
- c.  
Logical address

d.

Physical address

**Feedback**

Twoja odpowiedź jest niepoprawna.

The correct answer is: Logical address

**Question 14**

Incorrect

Mark 0.00 out of 1.00

Flag question

**Question text**

In which swapping algorithms is it necessary to collectively clear the M-bits?

Question 14Select one or more:

- a. second chance
- b. NRU
- c. LFU
- d. no algorithm
- e. LRU
- f. working set
- g. working set clock
- h. clock
- i. FIFO

**Feedback**

Twoja odpowiedź jest niepoprawna.

The correct answer is:

no algorithm

**Question 15**

Incorrect

Mark 0.00 out of 1.00

Flag question

**Question text**

Dynamic relocation requires the use of:

Question 15 Select one or more:

- a.  
limit register
- b.  
base register (DATUM)
- c.  
status register
- d.  
program counter

**Feedback**

Twoja odpowiedź jest niepoprawna.

The correct answer is: base register (DATUM)

Question **16**

Incorrect

Mark 0.00 out of 1.00

[Flag question](#)

**Question text**

In UNIX, access rights are attributes:

Question 16 Select one or more:

- a.  
An entry in the I-node table
- b.  
User descriptor
- c.  
A special table specifying access rights
- d.  
A directory entry for a file

**Feedback**

Twoja odpowiedź jest niepoprawna.

The correct answer is: An entry in the I-node table

Question **17**

Correct

Mark 1.00 out of 1.00

[Flag question](#)

**Question text**

Which of the following facilities or abilities are required to provide mutual exclusion support?

Question 17Select one or more:

- a.  
A task that is performed outside the critical section must not affect the behavior of a task in the critical section.
- b.  
The relative speeds of the tasks must be taken into account.
- c.  
The task stays in its critical section only for a finite amount of time.
- d.  
Task scheduling must be considered.

**Feedback**

Twoja odpowiedź jest poprawna.

The correct answers are: A task that is performed outside the critical section must not affect the behavior of a task in the critical section., The task stays in its critical section only for a finite amount of time.

Question 18

Correct

Mark 1.00 out of 1.00

[Flag question](#)

**Question text**

How is exception identification performed?

Question 18Select one or more:

- a.  
the specification of hardware interrupts and errors is given over the data bus
- b.  
the specification of hardware interrupts and traps is given over the data bus
- c.  
all exceptions are specified using the data bus
- d.  
the specification of hardware interrupts is given over the data bus

**Feedback**

Twoja odpowiedź jest poprawna.

The correct answer is: the specification of hardware interrupts is given over the data bus

Question 19

Correct

Mark 1.00 out of 1.00

[Flag question](#)

**Question text**

Paging is in thrashing if:

**Question 19Answer**

- a.  
the system spends less time paging than execution
- b.  
page cannot be swapped
- c.  
the system spends more time paging than execution
- d.  
page faults occur

**Feedback**

The correct answer is: the system spends more time paging than execution

**Question 20**

Incorrect

Mark 0.00 out of 1.00

[Flag question](#)

**Question text**

Allocation unit for file storage:

**Question 20Answer**

- a.  
may differ between files in a partition
- b.  
it should be selected to match the characteristics of the data
- c.  
may be a variable in a partition
- d.  
may vary between partitions

**Feedback**

The correct answer is: may vary between partitions

**Question 21**

Correct

Mark 1.00 out of 1.00

[Flag question](#)

**Question text**

If a linker prepares a program with absolute addresses to be loaded in a fixed address space, it is called:

**Question 21Answer**

- a.  
Dynamic linking
- b.  
Dynamic relocation

- c.  
Static linking
- d.  
Static relocation

#### Feedback

The correct answer is: Static relocation

#### Question 22

Correct

Mark 1.00 out of 1.00

[Flag question](#)

#### Question text

At the blocked state is a process that:

Question 22Select one or more:

- a.  
occupies a processor
- b.  
waits for a processor
- c.  
fills the processor idle time
- d.  
waits for an I/O operation to complete

#### Feedback

Twoja odpowiedź jest poprawna.

The correct answer is: waits for an I/O operation to complete

#### Question 23

Correct

Mark 1.00 out of 1.00

[Flag question](#)

#### Question text

The optimal scheduling algorithm in terms of minimizing the average time in the system of a given task is:

Question 23Select one or more:

- a.  
priority
- b.  
FCFS
- c.  
time slicing
- d.

SJF

Feedback

Twoja odpowiedź jest poprawna.

The correct answer is: SJF

**Question 24**

Incorrect

Mark 0.00 out of 1.00

Flag question

Question text

Allocation unit for storing files:

Question 24Answer

- a.  
may vary between partitions
- b.  
it should be selected to match the characteristics of the data
- c.  
must be constant across the disk partition
- d.  
may differ between files in a partition

Feedback

The correct answers are: must be constant across the disk partition, may vary between partitions

**Question 25**

Correct

Mark 1.00 out of 1.00

Flag question

Question text

Is IOW bit:

Question 25Select one or more:

- a.  
protection bit
- b.  
enable bit
- c.  
reference bit

Feedback

Twoja odpowiedź jest poprawna.

The correct answer is: protection bit

**Question 26**

Correct

Mark 1.00 out of 1.00

[Flag question](#)**Question text**

The Test-And-Set or Compare-And-Swap instruction has the following characteristics:

Question 26Select one or more:

a.

It is possible to use only in 1-processor systems

b.

Requires active waiting from tasks

c.

It is possible to deadlock with TAS/CAS operations on multiple variables

d.

It is possible to use only on computers with common memory

**Feedback**

Twoja odpowiedź jest poprawna.

The correct answers are: Requires active waiting from tasks, It is possible to use only on computers with common memory, It is possible to deadlock with TAS/CAS operations on multiple variables

**Question 27**

Correct

Mark 1.00 out of 1.00

[Flag question](#)**Question text**

Collective interrupt mask is:

Question 27Select one or more:

a.

a register that blocks or unblocks all interrupts

b.

a combinational circuit that calculates the number of the interrupt received

c.

register in which the address of the interrupt controller is stored

d.

a register that blocks or unlocks a non-maskable interrupt

**Feedback**

Twoja odpowiedź jest poprawna.

The correct answer is: a register that blocks or unblocks all interrupts

**Question 28**

Incorrect  
Mark 0.00 out of 1.00

Flag question

#### Question text

Which swapping algorithms can be implemented based on hardware support in the form of a collective reading of reference bits and collective clearing of these bits?

Question 28Select one or more:

- a.  
LRU
- b.  
FIFO
- c.  
working set clock
- d.  
optimal
- e.  
no algorithm
- f.  
LFU
- g.  
NRU
- h.  
working set
- i.  
second chance

#### Feedback

Twoja odpowiedź jest niepoprawna.

The correct answers are: LRU, LFU

Question 29

Correct  
Mark 1.00 out of 1.00

Flag question

#### Question text

The scheduler decisions take the form:

Question 29Select one or more:

- a.  
change from active to ready state
- b.  
change from waiting to ready state

- c.  
change from ready to active state
- d.  
change from waiting to active state

#### Feedback

Twoja odpowiedź jest poprawna.

The correct answer is: change from ready to active state

#### Question 30

Incorrect

Mark 0.00 out of 1.00

[Flag question](#)

#### Question text

Address translation aims to:

Question 30Select one or more:

- a.  
Generating a "frame error" interrupt when the page is out of memory
- b.  
detecting the phenomenon of locality of references
- c.  
converting a virtual address to a physical one
- d.  
converting a physical address to a virtual one

#### Feedback

Twoja odpowiedź jest niepoprawna.

The correct answer is: converting a virtual address to a physical one

#### Question 31

Incorrect

Mark 0.00 out of 1.00

[Flag question](#)

#### Question text

Fragmentation is implied by:

Question 31Select one or more:

- a.  
Internal by partitioning into quantized blocks
- b.  
External by resizing allocated blocks
- c.  
Internal by paging

d.

External by freeing blocks in a deallocation order not reverse to allocation

e.

External by segmentation

#### Feedback

Twoja odpowiedź jest niepoprawna.

The correct answers are: Internal by paging, Internal by partitioning into quantized blocks, External by freeing blocks in a deallocation order not reverse to allocation, External by resizing allocated blocks

#### Question 32

Correct

Mark 1.00 out of 1.00

Flag question

#### Question text

"Soft" real-time system:

Question 32Select one or more:

a.

Guarantees interrupt handling time

b.

Guarantees average response time

c.

Guaranteed response time

#### Feedback

Twoja odpowiedź jest poprawna.

The correct answer is: Guarantees average response time

#### Question 33

Correct

Mark 1.00 out of 1.00

Flag question

#### Question text

During the interrupt handling:

Question 33Select one or more:

a.

other interrupts may or may not be accepted at the discretion of the programmer

b.

other interrupts can be accepted

c.

other interrupts are disabled

**Feedback**

Twoja odpowiedź jest poprawna.

The correct answer is: other interrupts may or may not be accepted at the discretion of the programmer

**Question 34**

Incorrect

Mark 0.00 out of 1.00

[Flag question](#)

**Question text**

A multiprogram system is one that, in principle:

Question 34Select one or more:

- a.  
Requires relocation or equivalent mechanism
- b.  
It allows for storing many programs in primary memory
- c.  
Requires dynamic relocation
- d.  
It allows for running programs only one after another

**Feedback**

Twoja odpowiedź jest niepoprawna.

The correct answers are: It allows for storing many programs in primary memory, Requires relocation or equivalent mechanism

**Question 35**

Incorrect

Mark 0.00 out of 1.00

[Flag question](#)

**Question text**

A multiuser system is one that, in principle:

Question 35Select one or more:

- a.  
Must be concurrent
- b.  
Requires the use of timer interrupts
- c.  
Must be multi-threaded
- d.  
Allows multiple processes to actually run simultaneously

**Feedback**

Twoja odpowiedź jest niepoprawna.

The correct answers are: Must be concurrent, Requires the use of timer interrupts

**Question 36**

Correct

Mark 1.00 out of 1.00

Flag question

**Question text**

The scheduling goal, which is to occupy processors as efficiently as possible, is:

Question 36Select one or more:

- a.  
response time
- b.  
throughput
- c.  
utilization

**Feedback**

Twoja odpowiedź jest poprawna.

The correct answer is: utilization

**Question 37**

Correct

Mark 1.00 out of 1.00

Flag question

**Question text**

In a multitasking environment, the operating system decides which task the CPU gets, when, and for how long. This feature is called:

Question 37Answer

- a.  
traffic control
- b.  
task timetable management
- c.  
task management
- d.  
task scheduling

**Feedback**

The correct answer is: task scheduling

**Question 38**

Correct

Mark 1.00 out of 1.00

[Flag question](#)

#### Question text

Which of the following statements is true for system level threads?

Question 38Answer

a.

Multithreaded applications cannot use multiprocessing.

b.

User-level threads can be synchronized by the kernel.

c.

The threading implementation at the kernel level is done by the thread library attached to the program.

d.

Kernel-level threads require their descriptors in the kernel.

#### Feedback

The correct answer is: Kernel-level threads require their descriptors in the kernel.

Question 39

Correct

Mark 1.00 out of 1.00

[Flag question](#)

#### Question text

Interrupt mask:

Question 39Select one or more:

a.

causes interrupts to be disabled when an interrupt is accepted

b.

must be part of the status register

c.

can be set and reset by special processor instructions

d.

can unblock interrupts when the interrupt handler completes

#### Feedback

Twoja odpowiedź jest poprawna.

The correct answers are: causes interrupts to be disabled when an interrupt is accepted, can unblock interrupts when the interrupt handler completes, can be set and reset by special processor instructions

Question 40

Correct

Mark 1.00 out of 1.00

[Flag question](#)

**Question text**

What does the kernel do when there is no task (process) to run?

Question 40Select one or more:

- a.  
switches off the power supply
- b.  
resets the entire system
- c.  
starts the idle task
- d.  
executes an infinite loop in the kernel until a task arrives

**Feedback**

Twoja odpowiedź jest poprawna.

The correct answer is: starts the idle task

Question **41**

Correct

Mark 1.00 out of 1.00

[Flag question](#)

**Question text**

Is memory protection useless in a non-concurrent system?

Question 41Answer

True

False

**Feedback**

The correct answer is 'False'.

Question **42**

Correct

Mark 1.00 out of 1.00

[Flag question](#)

**Question text**

The program supervisor layer in the operating system has the following role:

Question 42Select one or more:

- a.  
Deals with the management of primary memory (memory allocation to programs)
- b.  
Intercepts all program system calls and routes them to the appropriate layers
- c.  
Runs programs
- d.

Deals with buffering data written and read from mass memory

**Feedback**

Twoja odpowiedź jest poprawna.

The correct answers are: Intercepts all program system calls and routes them to the appropriate layers, Runs programs, Deals with the management of primary memory (memory allocation to programs)

**Question 43**

Incorrect

Mark 0.00 out of 1.00

[Flag question](#)

**Question text**

A process always transitions from the "user" state to the "system" state as a result of:

Question 43Select one or more:

- a.  
Debugger trap
- b.  
Hardware interrupt
- c.  
Process suspension
- d.  
A software interrupt that calls a system function

**Feedback**

Twoja odpowiedź jest niepoprawna.

The correct answers are: A software interrupt that calls a system function, Debugger trap

**Question 44**

Correct

Mark 1.00 out of 1.00

[Flag question](#)

**Question text**

The key in associative memory is:

Question 44Select one or more:

- a.  
The page number concatenated with the frame number
- b.  
The frame number concatenated with the page number
- c.  
Frame number
- d.  
Page number

**Feedback**

Twoja odpowiedź jest poprawna.

The correct answer is: Page number

**Question 45**

Correct

Mark 1.00 out of 1.00

Flag question

**Question text**

At the ready state is a process that:

Question 45Select one or more:

- a. fills the processor idle time
- b. occupies a processor
- c. waits for a processor
- d. waits for an I/O operation to complete

**Feedback**

Twoja odpowiedź jest poprawna.

The correct answer is: waits for a processor

**Question 46**

Incorrect

Mark 0.00 out of 1.00

Flag question

**Question text**

Between fork and exec operations, the following operations are performed:

Question 46Select one or more:

- a. Loading the program to be started into memory
- b. Allocating the appropriate amount of memory for the program being started
- c. Opening the appropriate input/output files

**Feedback**

Twoja odpowiedź jest niepoprawna.

The correct answer is: Opening the appropriate input/output files

**Question 47**

Correct

Mark 1.00 out of 1.00

Flag question

#### Question text

How does the operating system call the task completion subroutine?

- Answer 1 Question 47 Choose...sets the trace in the terminating subroutine to the current position  
4. builds an interrupt vector on the system stack pointing to the terminating subroutine code  
builds the frame of the terminating subroutine on the task stack  
recreates the context programmatically and executes the IRET instruction

- Answer 2 Question 47 Choose...sets the trace in the terminating subroutine to the current position  
2. builds an interrupt vector on the system stack pointing to the terminating subroutine code  
builds the frame of the terminating subroutine on the task stack  
recreates the context programmatically and executes the IRET instruction

- Answer 3 Question 47 Choose...sets the trace in the terminating subroutine to the current position  
1. builds an interrupt vector on the system stack pointing to the terminating subroutine code  
builds the frame of the terminating subroutine on the task stack  
recreates the context programmatically and executes the IRET instruction

- Answer 4 Question 47 Choose...sets the trace in the terminating subroutine to the current position  
3. builds an interrupt vector on the system stack pointing to the terminating subroutine code  
builds the frame of the terminating subroutine on the task stack  
recreates the context programmatically and executes the IRET instruction

#### Feedback

Twoja odpowiedź jest poprawna.

The correct answer is: 4. → recreates the context programmatically and executes the IRET instruction, 2. → sets the trace in the terminating subroutine to the current position, 1. → builds the frame of the terminating subroutine on the task stack, 3. → builds an interrupt vector on the system stack pointing to the terminating subroutine code

### Question 48

Partially correct

Mark 0.50 out of 1.00

Flag question

#### Question text

Which of the following memory allocation schemes causes external fragmentation?

Question 48 Answer

- a.  
Multiple contiguous fixed partitions of equal size
- b.  
Paging
- c.  
Segmentation
- d.  
Multiple contiguous fixed partitions of various sizes

#### Feedback

The correct answers are: Segmentation, Multiple contiguous fixed partitions of various sizes

**Question 49**

Incorrect

Mark 0.00 out of 1.00

[Flag question](#)

**Question text**

The kernel is \_\_\_\_\_ user-level threads.

**Question 49Answer**

- a.  
unaware
- b.  
aware
- c.  
part
- d.  
creator

**Feedback**

The correct answer is: unaware

**Question 50**

Correct

Mark 1.00 out of 1.00

[Flag question](#)

**Question text**

Context switch is:

**Question 50Select one or more:**

- a.  
calling the kernel of the operating system
- b.  
switching to the system stack
- c.  
extracode execution
- d.  
writing registers to the task stack and retrieving them from another task stack

**Feedback**

Twoja odpowiedź jest poprawna.

The correct answer is: writing registers to the task stack and retrieving them from another task stack

**Question 51**

Correct

Mark 1.00 out of 1.00

Flag question

Question text

Operation V on a raised binary semaphore:

Question 51 Select one or more:

a.

It does not change the value of the semaphore

b.

Increases semaphore value by 1

c.

It is stored in order to be able to perform as many operations P as there were V

Feedback

Twoja odpowiedź jest poprawna.

The correct answer is: It does not change the value of the semaphore

Question 52

Incorrect

Mark 0.00 out of 1.00

Flag question

Question text

The combination of paging and segmentation consists in:

Question 52 Select one or more:

a.

identifying segments with pages

b.

the use of a segment table or a pool of segment registers treated as an additional, superior level of paging

c.

Generating a "frame error" interrupt when the frame containing the page does not belong to the current segment

d.

dividing pages into segments

Feedback

Twoja odpowiedź jest niepoprawna.

The correct answer is: the use of a segment table or a pool of segment registers treated as an additional, superior level of paging

Question 53

Correct

Mark 1.00 out of 1.00

Flag question

**Question text**

Scheduling algorithms can be:

Question 53Answer

- a. indulgent
- b. interrupting
- c. term changing
- d. preemptive

**Feedback**

The correct answers are: indulgent, preemptive

Question **54**

Incorrect

Mark 0.00 out of 1.00

[Flag question](#)

**Question text**

MMU uses index tables to:

Question 54Select one or more:

- a. generate an effective address
- b. generate a relative address
- c. generate a logical address
- d. generate a physical address

**Feedback**

Twoja odpowiedź jest niepoprawna.

The correct answer is: generate a physical address

Question **55**

Correct

Mark 1.00 out of 1.00

[Flag question](#)

**Question text**

When is the scheduler called?

Question 55Select one or more:

- a.

- at the request of a user task
- b.  
when the scheduler decides itself
- c.  
at the end of the execution of each kernel procedure
- d.  
at the start of execution of each kernel procedure

#### Feedback

Twoja odpowiedź jest poprawna.

The correct answer is: at the end of the execution of each kernel procedure

#### Question 56

Correct

Mark 1.00 out of 1.00

[Flag question](#)

#### Question text

After performing the mount(/dev/hd5,/usr/x/bin/hd5) operation, the file /usr/z/a on the mounted disk should be referenced by:

Question 56 Select one or more:

- a.  
`/dev/hd5/usr/z/a`
- b.  
`/usr/x/bin/hd5/usr/z/a`
- c.  
`/usr/x/bin/dev/hd5/usr/z/a`

#### Feedback

Twoja odpowiedź jest poprawna.

The correct answer is: `/usr/x/bin/hd5/usr/z/a`

#### Question 57

Correct

Mark 1.00 out of 1.00

[Flag question](#)

#### Question text

Interrupt vector is saved in a case of:

Question 57 Select one or more:

- a.  
jump with trace
- b.  
accepting a non-maskable interrupt
- c.

subroutine call

d.

accepting a hardware interrupt

**Feedback**

Twoja odpowiedź jest poprawna.

The correct answers are: accepting a hardware interrupt, accepting a non-maskable interrupt, jump with trace

**Question 58**

Correct

Mark 1.00 out of 1.00

[Flag question](#)

**Question text**

What are the functions of the kernel?

**Question 58Answer**

a.

File management

b.

Memory management

c.

Interrupt handling

d.

Program management

**Feedback**

The correct answer is: Interrupt handling

**Question 59**

Correct

Mark 1.00 out of 1.00

[Flag question](#)

**Question text**

By definition, a deadlock is a situation where:

**Question 59Select one or more:**

a.

at least two processes are waiting for conditions that cannot be met

b.

any greater than zero number of processes are waiting for conditions that cannot be met

c.

any greater than one number of processes are waiting for conditions that cannot be met

d.

exactly two processes are waiting for conditions that cannot be met

### Feedback

Twoja odpowiedź jest poprawna.

The correct answer is: any greater than zero number of processes are waiting for conditions that cannot be met

### Question 60

Correct

Mark 1.00 out of 1.00

Flag question

### Question text

In a concurrent environment, the operating system decides which task the CPU gets, when, and for how long. This feature is called:

#### Question 60Answer

a.

task scheduling

b.

traffic management

c.

task management

d.

task timetable planning

### Feedback

The correct answer is: task scheduling

### Question 61

Correct

Mark 5.00 out of 5.00

Flag question

### Question text

What is the average time in the system for tasks in the batch, using SJF algorithm?

task	1	2	3	4
processing time	3.1	6.7	2.8	1.1

Answer:Question 61

### Feedback

The correct answer is: 6.4

### Question 62

Incorrect

Mark 0.00 out of 5.00

Flag question

### Question text

In RAID 4, data is placed in Strips that are "scattered" over the data disks, so that each subsequent strip is on the next data disk, modulo the number of disks. For this, there is a parity disk that holds the parity bits of zeroth bits, first bits, second bits, etc., equal-numbered strips divided by the number of data disks, for example, strips 0-3, 4-7, 8-11, etc.:

the start of strips 0,1,2,3 looks like this:

0	1	0	0	1	Parity disk
0	0	0	0	0	Disk 3
1	0	1	1	0	Disk 2
1	1	0	0	1	Disk 1
0	1	1	0	0	Disk 0

In the parity strip, the values are placed so that the parity bit keeps the corresponding strip bits 0-3 odd.

Disk 3 has been damaged and reads only 0. After replacing the disk with a new one, what values should be put in the strip on disk 3?

Answer:Question 62

### Feedback

The correct answer is: 10101

Question **63**

Incorrect

Mark 0.00 out of 5.00

Flag question

### Question text

Assuming memory cells are 1-byte, the page number in the address field is 12 bits, the offset is 12 bits, the frame number is 10 bits, and all entries in the TIS page index table are on a 16-bit word boundary, enter:

- the maximum size of the program's virtual memory in MB

Answer:Question 63

### Feedback

The correct answer is: 4

<b>Started on</b>	Wednesday, 19 June 2024, 12:16 PM
<b>State</b>	Finished
<b>Completed on</b>	Wednesday, 19 June 2024, 1:57 PM
<b>Time taken</b>	1 hour 41 mins
<b>Marks</b>	37.58/75.00
<b>Grade</b>	20.04 out of 40.00 (50.11%)

**Question 1**

Correct

Mark 1.00 out of 1.00

The root directory of the disk should be located:

- a. in a place hard-coded in the structures of the operating system
- b. in a place designated by the data structure in a fixed location on the disk ✓
- c. at a fixed address in main memory
- d. in a permanent place on the disk

The correct answer is: in a place designated by the data structure in a fixed location on the disk

**Question 2**

Partially correct

Mark 0.67 out of 1.00

Twins algorithm:

Select one or more:

- a. Causes external fragmentation ✓
- b. Causes less fragmentation than static division into equal blocks
- c. Causes internal fragmentation ✓

Twoja odpowiedź jest częściowo poprawna.

You have correctly selected 2.

The correct answers are: Causes internal fragmentation, Causes external fragmentation, Causes less fragmentation than static division into equal blocks

**Question 3**

Correct

Mark 1.00 out of 1.00

The kernel (microkernel) is responsible for:

Select one or more:

- a. task control ✓
- b. memory allocation and freeing
- c. interrupt handling (at the elementary level, then they are passed on to other layers). ✓
- d. synchronization of processes and devices with processes ✓

Twoja odpowiedź jest poprawna.

The correct answers are: task control, synchronization of processes and devices with processes, interrupt handling (at the elementary level, then they are passed on to other layers).

**Question 4**

Partially correct

Mark 0.67 out of 1.00

In UNIX, access rights are specified:

Select one or more:

- a. Separately for write, read and execute/search ✓
- b. Separately for the user, the group to which the user belongs and for all others ✓
- c. Individually for each file
- d. At the same time, for all files in a given directory owned by the user

Twoja odpowiedź jest częściowo poprawna.

You have correctly selected 2.

The correct answers are: Individually for each file, Separately for the user, the group to which the user belongs and for all others, Separately for write, read and execute/search

**Question 5**

Incorrect

Mark 0.00 out of 1.00

The logical address is also:

Select one or more:

- a. Relative address ✗
- b. Effective address ✓
- c. Physical address ✗
- d. Absolute address

Twoja odpowiedź jest niepoprawna.

The correct answer is: Effective address

**Question 6**

Incorrect

Mark 0.00 out of 1.00

Internal fragmentation consists in:

Select one or more:

- a. The program does not use all the memory allocated to it
- b. Dividing the memory allocated to the program into a data area and a code area
- c. Free memory blocks between allocated blocks ✗
- d. Discontiguous file allocation on disk

Twoja odpowiedź jest niepoprawna.

The correct answer is: The program does not use all the memory allocated to it

**Question 7**

Correct

Mark 1.00 out of 1.00

Which scheduling is used to organize concurrency?

Select one or more:

- a. medium-term
- b. short-term ✓
- c. preempting
- d. long-term

Twoja odpowiedź jest poprawna.

The correct answer is: short-term

**Question 8**

Incorrect

Mark 0.00 out of 1.00

Which of the following few common services can be partially provided by software other than the operating system?

- a. I/O operations ✗
- b. Manipulating the file system ✓
- c. Security and protection
- d. Running programs

The correct answers are: Security and protection, Manipulating the file system

**Question 9**

Correct

Mark 1.00 out of 1.00

The return from interrupt instruction:

Select one or more:

- a. restores general purpose registers
- b. restores the interrupt vector ✓
- c. always jumps to the process that was interrupted
- d. restores the stack pointer

Twoja odpowiedź jest poprawna.

The correct answer is: restores the interrupt vector

**Question 10**

Correct

Mark 1.00 out of 1.00

Operation V on a raised binary semaphore:

Select one or more:

- a. It is stored in order to be able to perform as many operations P as there were V
- b. It does not change the value of the semaphore ✓
- c. Increases semaphore value by 1

Twoja odpowiedź jest poprawna.

The correct answer is: It does not change the value of the semaphore

**Question 11**

Incorrect

Mark 0.00 out of 1.00

The effective address is at the same time:

Select one or more:

- a. relative address
- b. indirect address ✗
- c. logical address
- d. physical address

Twoja odpowiedź jest niepoprawna.

The correct answer is: logical address

**Question 12**

Correct

Mark 1.00 out of 1.00

The hardware resources of a computer system are:

Select one or more:

- a. Windows on the screen
- b. Peripheral devices ✓
- c. Processor time ✓
- d. Primary memory ✓

Twoja odpowiedź jest poprawna.

The correct answers are: Processor time, Primary memory, Peripheral devices

**Question 13**

Partially correct

Mark 0.50 out of 1.00

The following paging exceptions allow for returning to the program after they occur:

Select one or more:

- a. attempting to write to a write-protected frame
- b. attempt to read from the frame storing the code
- c. page fault ✓
- d. interrupt on write (IOW)

Twoja odpowiedź jest częściowo poprawna.

You have correctly selected 1.

The correct answers are: page fault, interrupt on write (IOW)

**Question 14**

Incorrect

Mark 0.00 out of 1.00

How does the operating system call the task completion subroutine?

4. sets the trace in the terminating subroutine to the current position ✗
2. builds the frame of the terminating subroutine on the task stack ✗
1. builds an interrupt vector on the system stack pointing to the terminating subroutine code ✗
3. recreates the context programmatically and executes the IRET instruction ✗

Twoja odpowiedź jest niepoprawna.

The correct answer is: 4. → recreates the context programmatically and executes the IRET instruction, 2. → sets the trace in the terminating subroutine to the current position, 1. → builds the frame of the terminating subroutine on the task stack, 3. → builds an interrupt vector on the system stack pointing to the terminating subroutine code

**Question 15**

Correct

Mark 1.00 out of 1.00

Dynamic relocation requires the use of:

Select one or more:

- a. limit register
- b. status register
- c. base register (DATUM) ✓
- d. program counter

Twoja odpowiedź jest poprawna.

The correct answer is: base register (DATUM)

**Question 16**

Incorrect

Mark 0.00 out of 1.00

What mechanism is used to desynchronize processes with different relative speeds?

Select one or more:

- a. buffer
- b. preempting
- c. interrupts ✗
- d. scheduling

Twoja odpowiedź jest niepoprawna.

The correct answer is: buffer

**Question 17**

Correct

Mark 1.00 out of 1.00

Which of the following information is stored on task switching?

- a. I/O status information ✓
- b. Contents of datum, limit and other registers inaccessible to the program ✓
- c. scheduler data ✓
- d. Contents of general purpose registers, program counter, and similar registers available to the program ✓

The correct answers are: I/O status information, scheduler data, Contents of datum, limit and other registers inaccessible to the program, Contents of general purpose registers, program counter, and similar registers available to the program

**Question 18**

Correct

Mark 1.00 out of 1.00

The direct resume rule means that:

Select one or more:

- a. The resuming process gets a critical region after the resumed process exits the critical region
- b. The resuming process applies for the critical region just like other processes waiting to enter the critical region ✓
- c. The resuming process loses the critical region ✓

Twoja odpowiedź jest poprawna.

The correct answers are: The resuming process loses the critical region, The resuming process applies for the critical region just like other processes waiting to enter the critical region

**Question 19**

Partially correct

Mark 0.50 out of 1.00

Static relocation is performed by:

- a. Special registers (DATUM)
- b. Loader ✓
- c. Compiler
- d. Segment descriptors

The correct answers are: Compiler, Loader

**Question 20**

Partially correct

Mark 0.50 out of 1.00

For address translation, the following is used:

Select one or more:

- a. reference and protection bits
- b. translation register
- c. associative translation buffer ✓
- d. index table

Twoja odpowiedź jest częściowo poprawna.

You have correctly selected 1.

The correct answers are: index table, associative translation buffer

**Question 21**

Correct

Mark 1.00 out of 1.00

The system stack must provide space for:

Select one or more:

- a. CPU registers
- b. Processor registers in as many copies as there are devices in the system +1
- c. Processor registers in as many copies as there are interrupt lines +1 ✓
- d. Processor registers in as many copies as there are interrupt lines and possible software interrupts

Twoja odpowiedź jest poprawna.

The correct answer is: Processor registers in as many copies as there are interrupt lines +1

**Question 22**

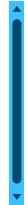
Correct

Mark 1.00 out of 1.00

Connection with segmentation consists in:

Select one or more:

- a. The use of a segment table or pool of segment registers treated as an additional, superior level of paging ✓
- b. Dividing pages into segments
- c. Generating a "frame error" interrupt when the frame containing the page does not belong to the current segment
- d. Identifying segments with pages



Twoja odpowiedź jest poprawna.

The correct answer is: The use of a segment table or pool of segment registers treated as an additional, superior level of paging

**Question 23**

Incorrect

Mark 0.00 out of 1.00

What type of code can multiple processes execute simultaneously?

Select one or more:

- a. reentrant ✓
- b. binary
- c. self-modifying
- d. dynamically relocated ✗

Twoja odpowiedź jest niepoprawna.

The correct answer is: reentrant

**Question 24**

Incorrect

Mark 0.00 out of 1.00

a page fault interrupt is issued when:

Select one or more:

- a. the program is accessing a page that is not in the cache ✗
- b. the program accesses the page
- c. the program accesses a page that is not in the primary memory ✓
- d. an error has occurred on the current page

Twoja odpowiedź jest niepoprawna.

The correct answer is: the program accesses a page that is not in the primary memory

**Question 25**

Correct

Mark 1.00 out of 1.00

The scheduler decisions take the form:

Select one or more:

- a. change from ready to active state ✓
- b. change from waiting to active state
- c. change from active to ready state
- d. change from waiting to ready state

Twoja odpowiedź jest poprawna.

The correct answer is: change from ready to active state

**Question 26**

Correct

Mark 1.00 out of 1.00

Using the Test-And-Set instruction in synchronization:

Select one or more:

- a. Requires organizing inactive waiting in queues
- b. It requires processes to actively wait ✓
- c. Requires an explicit relinquishment of the processor to another process
- d. Stops the processor if 0 is read

Twoja odpowiedź jest poprawna.

The correct answer is: It requires processes to actively wait

**Question 27**

Correct

Mark 1.00 out of 1.00

Address translation aims to:

Select one or more:

- a. converting a physical address to a virtual one
- b. converting a virtual address to a physical one ✓
- c. detecting the phenomenon of locality of references
- d. Generating a "frame error" interrupt when the page is out of memory

Twoja odpowiedź jest poprawna.

The correct answer is: converting a virtual address to a physical one

**Question 28**

Incorrect

Mark 0.00 out of 1.00

System/user threads:

Select one or more:

- a. User-level threads share the same stack. ✗
- b. User-level threads share the same execution context.
- c. System level thread descriptors are stored in the operating system kernel. ✓

Twoja odpowiedź jest niepoprawna.

The correct answers are: System level thread descriptors are stored in the operating system kernel., User-level threads share the same execution context.

**Question 29**

Incorrect

Mark 0.00 out of 1.00

The program must be specially compiled to run in paged memory.

- True ✗
- False

The correct answer is 'False'.

**Question 30**

Incorrect

Mark 0.00 out of 1.00

The mechanism for moving programs between primary memory and mass storage is called:

- a. sweeping
- b. swapping ✗
- c. leaching
- d. leading out

The correct answer is: sweeping

**Question 31**

Incorrect

Mark 0.00 out of 1.00

The internal state of the file system layer is available for:

- a. Applications ✗
- b. User programs ✗
- c. OS kernel ✓
- d. Program supervisor layer

The correct answers are: OS kernel, Program supervisor layer

**Question 32**

Correct

Mark 1.00 out of 1.00

Sequence of actions when starting a new task:

1. filling in the descriptor in the kernel ✓
2. memory allocation if this is the first task of the program ✓
3. initialize the stack, fill the first frame ✓
4. instruction to transfer control to the task ✓

Twoja odpowiedź jest poprawna.

The correct answer is: 1. → filling in the descriptor in the kernel, 2. → memory allocation if this is the first task of the program, 3. → initialize the stack, fill the first frame, 4. → instruction to transfer control to the task

**Question 33**

Correct

Mark 1.00 out of 1.00

The page index table address is stored in:

Select one or more:

- a. program counter
- b. page register
- c. stack pointer
- d. page table base register ✓

Twoja odpowiedź jest poprawna.

The correct answer is: page table base register

**Question 34**

Incorrect

Mark 0.00 out of 1.00

Is IOW bit:

Select one or more:

- a. protection bit
- b. reference bit ✗
- c. enable bit

Twoja odpowiedź jest niepoprawna.

The correct answer is: protection bit

**Question 35**

Correct

Mark 1.00 out of 1.00

When starting a program, how is control passed to it from the operating system?

Select one or more:

- a. extracode
- b. jump with trace
- c. jump
- d. return from interrupt handler IRET ✓

Twoja odpowiedź jest poprawna.

The correct answer is: return from interrupt handler IRET

**Question 36**

Incorrect

Mark 0.00 out of 1.00

The software resources of a computer system are:

Select one or more:

- a. Files ✓
- b. Buffers ✓
- c. Semaphores ✓
- d. Primary memory ✗

Twoja odpowiedź jest niepoprawna.

The correct answers are: Files, Buffers, Semaphores

**Question 37**

Correct

Mark 1.00 out of 1.00

The main function of shared memory is:

- a. inter-process communication ✓
- b. use working memory efficiently
- c. inter-process synchronization
- d. inter-process scheduling

The correct answer is: inter-process communication

**Question 38**

Incorrect

Mark 0.00 out of 1.00

Which of the following facilities or abilities are required to provide mutual exclusion support?

Select one or more:

- a. The relative speeds of the tasks must be taken into account.
- b. Task scheduling must be considered. ✗
- c. A task that is performed outside the critical section must not affect the behavior of a task in the critical section.
- d. The task stays in its critical section only for a finite amount of time. ✓

Twoja odpowiedź jest niepoprawna.

The correct answers are: A task that is performed outside the critical section must not affect the behavior of a task in the critical section., The task stays in its critical section only for a finite amount of time.

**Question 39**

Incorrect

Mark 0.00 out of 1.00

Allocation unit for file storage:

- a. must be constant across the disk partition
- b. may vary between partitions ✓
- c. may differ between files in a partition
- d. is any integer multiple of a sector (>0) ✗

The correct answers are: must be constant across the disk partition, may vary between partitions

**Question 40**

Incorrect

Mark 0.00 out of 1.00

Frame protection bits:

Select one or more:

- a. must be available for group clear
- b. must be readable ✗
- c. must be group readable
- d. must be available for writing ✓

Twoja odpowiedź jest niepoprawna.

The correct answer is: must be available for writing

**Question 41**

Correct

Mark 1.00 out of 1.00

The following situations cause "error" exceptions (processor internal interrupts)

Select one or more:

- a. extracode
- b. illegal instruction ✓
- c. instruction legal but prohibited in user mode ✓

Twoja odpowiedź jest poprawna.

The correct answers are: illegal instruction, instruction legal but prohibited in user mode

**Question 42**

Correct

Mark 1.00 out of 1.00

Precise interrupts are:

Select one or more:

- a. unblocked only in a stable state between the execution of successive instructions
- b. only issued in a stable state between executions of subsequent instructions
- c. accepted only in a stable state between the execution of successive instructions ✓
- d. transferred only in a stable state between the execution of successive instructions instrukcji

Twoja odpowiedź jest poprawna.

The correct answer is: accepted only in a stable state between the execution of successive instructions

**Question 43**

Correct

Mark 1.00 out of 1.00

What mechanism is used to preserve the states of preempted tasks?

- a. time slice
- b. batch work
- c. task period
- d. context switch ✓

The correct answer is: context switch

**Question 44**

Partially correct

Mark 0.25 out of 1.00

In the sweeping mechanism, a program should be loaded into memory when:

Select one or more:

- a. The programmatical condition for the continuation of the program was met by another program
- b. The device the program was waiting for has freed up ✓
- c. The time the program was supposed to be "wake up" has occurred
- d. The data transmission to the printer, ordered by the program, has ended

Twoja odpowiedź jest częściowo poprawna.

You have correctly selected 1.

The correct answers are: The data transmission to the printer, ordered by the program, has ended, The programmatical condition for the continuation of the program was met by another program, The device the program was waiting for has freed up, The time the program was supposed to be "wake up" has occurred

**Question 45**

Correct

Mark 1.00 out of 1.00

With indulgent scheduling, once a CPU is allocated to a task, the task keeps it until:

Select one or more:

- a. transition a task from the ready state to the active state
- b. releasing the processor by the task ✓
- c. task termination ✓
- d. transition a task from the active state to the ready state

Twoja odpowiedź jest poprawna.

The correct answers are: task termination, releasing the processor by the task

**Question 46**

Correct

Mark 1.00 out of 1.00

The thread is also called:

- a. heavy process
- b. lightweight process ✓
- c. data process
- d. overlay process

The correct answer is: lightweight process

**Question 47**

Incorrect

Mark 0.00 out of 1.00

In UNIX, access rights are attributes:

Select one or more:

- a. An entry in the I-node table
- b. User descriptor
- c. A directory entry for a file ✗
- d. A special table specifying access rights

Twoja odpowiedź jest niepoprawna.

The correct answer is: An entry in the I-node table

**Question 48**

Partially correct

Mark 0.50 out of 1.00

Discontinuous allocation is the result of:

Select one or more:

- a. compacting
- b. paging
- c. reloaction
- d. segmentation ✓

Twoja odpowiedź jest częściowo poprawna.

You have correctly selected 1.

The correct answers are: paging, segmentation

**Question 49**

Incorrect

Mark 0.00 out of 1.00

The behavior of the exchange algorithm opposite to that expected with the measures taken is called:

Answer: the exchange algorithm opposite to that expected with the measures taken is referred to as “sun” ✗

The correct answer is: anomaly

**Question 50**

Partially correct

Mark 0.33 out of 1.00

Which of the following interrupts a running process?

- a. Hardware interrupt
- b. Timer interrupts ✓
- c. Scheduler
- d. Power fail interrupt

The correct answers are: Hardaware interrupt, Timer interrupts, Power fail interrupt

**Question 51**

Correct

Mark 1.00 out of 1.00

Scheduling aims to optimize:

Select one or more:

- a. processor utilization ✓
- b. reaction time ✓
- c. wait time ✓
- d. system throughput ✓

Twoja odpowiedź jest poprawna.

The correct answers are: processor utilization, system throughput, wait time, reaction time

**Question 52**

Correct

Mark 1.00 out of 1.00

The multi-level interrupt controller includes:

Select one or more:

- a. The register of interrupt being serviced
- b. Priority encoder ✓
- c. Individual interrupt mask ✓
- d. Collective interrupt mask ✓

Twoja odpowiedź jest poprawna.

The correct answers are: Collective interrupt mask, Individual interrupt mask, Priority encoder

**Question 53**

Partially correct

Mark 0.50 out of 1.00

Using Test-And-Set or Compare-And-Swap in synchronization:

Select one or more:

- a. Stops the processor if 0 is read
- b. Requires organizing inactive waiting in queues
- c. It can only be applied in systems with shared memory
- d. It requires processes to actively wait ✓

Twoja odpowiedź jest częściowo poprawna.

You have correctly selected 1.

The correct answers are: It requires processes to actively wait,  
It can only be applied in systems with shared memory

**Question 54**

Correct

Mark 1.00 out of 1.00

Scheduling algorithms can be:

- a. indulgent ✓
- b. preemptive ✓
- c. interrupting
- d. term changing

The correct answers are: indulgent, preemptive

**Question 55**

Incorrect

Mark 0.00 out of 1.00

The following situations trigger exceptions (processor internal interrupts) of the "error" type:

Select one or more:

- a. an attempt to write to the page for which the "read only" bit was set ✓
- b. memory reference beyond limit register value ✓
- c. memory reference in the area of the page that is not in memory ✗
- d. a reference to memory that is not in the address space ✓

Twoja odpowiedź jest niepoprawna.

The correct answers are: a reference to memory that is not in the address space, memory reference beyond limit register value, an attempt to write to the page for which the "read only" bit was set

**Question 56**

Partially correct

Mark 0.67 out of 1.00

What is included in the context that must be saved for a synchronous (inter-instruction) precision interrupt?

Select one or more:

- a. instruction register
- b. collective of individual interrupt mask
- c. program counter ✓
- d. general purpose registers ✓

Twoja odpowiedź jest częściowo poprawna.

You have correctly selected 2.

The correct answers are: general purpose registers, program counter, collective of individual interrupt mask

**Question 57**

Partially correct

Mark 0.50 out of 1.00

In a FAT-based disk system (without sharing allocation units by files), the number of files is directly limited by:

Select one or more:

- a. The size of the disk space
- b. Allocation unit size
- c. The number of bits of the field describing the size of the file
- d. The number of bits of the disk address
- e. FAT table size ✓

Twoja odpowiedź jest częściowo poprawna.

You have correctly selected 1.

The correct answers are: FAT table size, The size of the disk space

**Question 58**

Incorrect

Mark 0.00 out of 1.00

Which of the following memory allocation schemes cause external fragmentation?

- a. Sweeping
- b. Segmentation
- c. Paging
- d. Multiple contiguous fixed partitions of equal size ✗

The correct answers are: Segmentation, Sweeping

**Question 59**

Incorrect

Mark 0.00 out of 1.00

The sweeping mechanism consists in:

Select one or more:

- a. Loading pages into the primary memory and sending them to the disk
- b. Loading segments into primary memory and sending them to disk
- c. Merging adjacent free memory blocks
- d. Moving programs around in memory to eliminate fragmentation ✗

Twoja odpowiedź jest niepoprawna.

The correct answer is: Loading segments into primary memory and sending them to disk

**Question 60**

Correct

Mark 1.00 out of 1.00

Having two-level page index tables:

Select one or more:

- a. the content of a level I table element is added to the content of a level II table element
- b. the content of a level I table element points to a level II table ✓
- c. the content of the level I table element is concatenated (combined) with the content of the level II table element
- d. the content of a level I table element is an index in a level II table

Twoja odpowiedź jest poprawna.

The correct answer is: the content of a level I table element points to a level II table

**Question 61**

Incorrect

Mark 0.00 out of 5.00

What is the average time in the system for tasks in the batch, using SJF algorithm?

task	1	2	3	4
processing time	3.3	6.8	2.4	1.2

Answer:

3.8



The correct answer is: 6.3

**Question 62**

Incorrect

Mark 0.00 out of 5.00

In RAID 4, data is placed in Strips that are "scattered" over the data disks, so that each subsequent strip is on the next data disk, modulo the number of disks. For this, there is a parity disk that holds the parity bits of zeroth bits, first bits, second bits, etc., equal-numbered strips divided by the number of data disks, for example, strips 0-3, 4-7, 8-11, etc.:



the start of strips 0,1,2,3 looks like this:

1	1	1	0	0	Parity disk
0	0	0	0	0	Disk 3
1	0	0	1	0	Disk 2
1	0	1	0	1	Disk 1
0	1	1	0	0	Disk 0

In the parity strip, the values are placed so that the parity bit keeps the corresponding strip bits 0-3 even.

Disk 3 has been damaged and reads only 0. After replacing the disk with a new one, what values should be put in the strip on disk 3?

Answer:  ×

The correct answer is: 10111

**Question 63**

Correct

Mark 5.00 out of 5.00

The virtual address consists of 8b page number and 8b offset. The page index table is shown below (index, content). For decimal address 384, binary 0000 0001 1000 0000, enter the physical address in the form: frame number.offset (as decimal numbers, offset in 3 digits). For example, for a physical address consisting of frame 0 and offset 18, specify 0.018. If there is no physical address for the given virtual address, then -1 should be specified.

7	12
6	-1
5	7
4	4
3	9
2	-1
1	3
0	2

Answer: 3.128 

The correct answer is: 3.128

<b>Started on</b>	Thursday, 27 June 2024, 12:36 PM
<b>State</b>	Finished
<b>Completed on</b>	Thursday, 27 June 2024, 1:48 PM
<b>Time taken</b>	1 hour 11 mins
<b>Marks</b>	53.58/75.00
<b>Grade</b>	22.86 out of 32.00 ( <b>71.44%</b> )

**Question 1**

Correct

Mark 1.00 out of 1.00

Which swapping algorithms can be implemented based on hardware support in the form of a collective reading of reference bits and collective clearing of these bits?

Select one or more:

- a. LFU ✓
- b. FIFO
- c. LRU ✓
- d. optimal
- e. second chance
- f. NRU
- g. working set clock
- h. no algorithm
- i. working set

Twoja odpowiedź jest poprawna.

The correct answers are: LRU, LFU

**Question 2**

Correct

Mark 1.00 out of 1.00

Consider the following sequence of address references:

123, 215, 600, 1234, 76, 96.

If the page size is 100, the order of page references is as follows:

- a. 1,2,6,12
- b. 0,2,6,12,0,0
- c. 1,2,6,12,0,0 ✓
- d. 12,21,60,123,7,9

The correct answer is: 1,2,6,12,0,0

**Question 3**

Correct

Mark 1.00 out of 1.00

Imprecise interrupts can be handled:

Select one or more:

- a. only when the program allows accepting interrupts
- b. after clearing the pipeline from the instructions ✓
- c. after saving the full state of the pipeline ✓
- d. when new instructions are suspended to be fetched into the pipeline

Twoja odpowiedź jest poprawna.

The correct answers are: after clearing the pipeline from the instructions, after saving the full state of the pipeline

**Question 4**

Correct

Mark 1.00 out of 1.00

Address translation mechanism:

Select one or more:

- a. concatenates the frame number and page number
- b. concatenates the page number and page offset
- c. concatenates the frame number and offset on the page ✓
- d. adds the frame number to the page number

Twoja odpowiedź jest poprawna.

The correct answer is: concatenates the frame number and offset on the page

**Question 5**

Correct

Mark 1.00 out of 1.00

FIRST-FIT algorithm:

Select one or more:

- a. Requires an ascending sorting of the list of free blocks
- b. Avoids external fragmentation
- c. Causes external fragmentation ✓
- d. It allows for fast determining whether there is a free block of the required size

Twoja odpowiedź jest poprawna.

The correct answer is: Causes external fragmentation

**Question 6**

Correct

Mark 1.00 out of 1.00

SJF selects the task:

- a. which was first placed in the queue
- b. with the least CPU requirement ✓
- c. which was last placed in the queue
- d. who waited the longest in the queue

The correct answer is: with the least CPU requirement

**Question 7**

Partially correct

Mark 0.67 out of 1.00

What is true for simultaneous execution in the same context?

- a. The use of threads ensures concurrency within the process.
- b. A multiprocessor kernel can be concurrent ✓
- c. Threads minimize context switch time. ✓
- d. The shared context forces threads to run on the same processor

The correct answers are: Threads minimize context switch time., The use of threads ensures concurrency within the process., A multiprocessor kernel can be concurrent

**Question 8**

Correct

Mark 1.00 out of 1.00

The file system layer plays the following role in the operating system:

Select one or more:

- a. Controls file access rights ✓
- b. Performs file opening and closing operations ✓
- c. It performs directory services in the hierarchy of disk files ✓
- d. It runs programs stored in files

Twoja odpowiedź jest poprawna.

The correct answers are: Performs file opening and closing operations, It performs directory services in the hierarchy of disk files, Controls file access rights

**Question 9**

Correct

Mark 1.00 out of 1.00

Processor access scheduling decisions may be made under which of the following circumstances?

Select one or more:

- a. When a task transitions from the active state to the ready state ✓
- b. When a task terminates ✓
- c. When a task goes from the waiting state to the ready state ✓
- d. When a task goes from the active state to the waiting state ✓

Twoja odpowiedź jest poprawna.

The correct answers are: When a task goes from the active state to the waiting state, When a task transitions from the active state to the ready state, When a task goes from the waiting state to the ready state, When a task terminates

**Question 10**

Correct

Mark 1.00 out of 1.00

In which swapping algorithms is it necessary to collectively clear the M-bits?

Select one or more:

- a. no algorithm ✓
- b. working set clock
- c. NRU
- d. working set
- e. LFU
- f. FIFO
- g. clock
- h. LRU
- i. second chance

Twoja odpowiedź jest poprawna.

The correct answer is:

no algorithm

**Question 11**

Correct

Mark 1.00 out of 1.00

Static relocation is performed by:

- a. Special registers (DATUM)
- b. Loader ✓
- c. Paging system
- d. Segment descriptors

The correct answer is: Loader

**Question 12**

Correct

Mark 1.00 out of 1.00

What mechanism is part of time-sharing systems?

- a. short-term scheduler ✓
- b. long-term scheduler
- c. swapping
- d. medium-term scheduler

The correct answer is: short-term scheduler

**Question 13**

Correct

Mark 1.00 out of 1.00

Context switch is:

Select one or more:

- a. switching to the system stack
- b. calling the kernel of the operating system
- c. writing registers to the task stack and retrieving them from another task stack ✓
- d. extracode execution

Twoja odpowiedź jest poprawna.

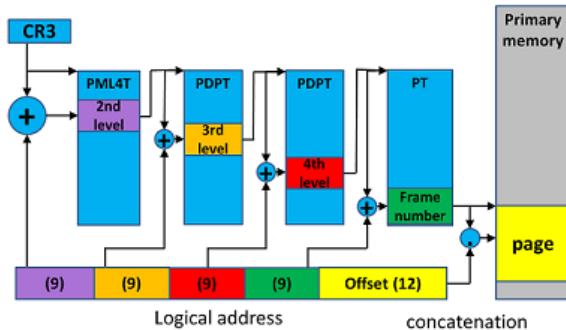
The correct answer is: writing registers to the task stack and retrieving them from another task stack

**Question 14**

Correct

Mark 1.00 out of 1.00

In the four-level page index table, the frame number is:



Select one or more:

- a. in the first level table - the leftmost in the figure
- b. part in the table of each level
- c. in the table of the last level - the rightmost in the figure ✓
- d. none of the above answers

Twoja odpowiedź jest poprawna.

The correct answer is: in the table of the last level - the rightmost in the figure

**Question 15**

Correct

Mark 1.00 out of 1.00

Virtual memory consists of:

Select one or more:

- a. primary memory and storage memory ✓
- b. primary memory and cloud storage
- c. main memory and cache
- d. cache and storage memory

Twoja odpowiedź jest poprawna.

The correct answer is: primary memory and storage memory

**Question 16**

Incorrect

Mark 0.00 out of 1.00

What type of code can execute on multiple datasets in parallel:

Select one or more:

- a. binary
- b. dynamically relocated ✗
- c. reentrant

Twoja odpowiedź jest niepoprawna.

The correct answer is: reentrant

**Question 17**

Correct

Mark 1.00 out of 1.00

What mechanism is used to desynchronize processes with different relative speeds?

Select one or more:

- a. scheduling
- b. preempting
- c. buffer ✓
- d. interrupts

Twoja odpowiedź jest poprawna.

The correct answer is: buffer

**Question 18**

Incorrect

Mark 0.00 out of 1.00

Address translation mechanism:

Select one or more:

- a. Concatenates the frame number and offset on the page
- b. Concatenates the frame number and page number
- c. Concatenates the page number and page offset ✗
- d. Adds the frame number to the page number

Twoja odpowiedź jest niepoprawna.

The correct answer is: Concatenates the frame number and offset on the page

**Question 19**

Correct

Mark 1.00 out of 1.00

When starting a program, how is control passed to it from the operating system?

Select one or more:

- a. jump
- b. extracode
- c. return from interrupt handler IRET ✓
- d. jump with trace

Twoja odpowiedź jest poprawna.

The correct answer is: return from interrupt handler IRET

**Question 20**

Correct

Mark 1.00 out of 1.00

The sweeping criteria include:

Select one or more:

- a. Analysis of program execution history ✓
- b. Program state ✓
- c. Segment referencing frequency
- d. Priority ✓

Twoja odpowiedź jest poprawna.

The correct answers are: Priority, Program state, Analysis of program execution history

**Question 21**

Correct

Mark 1.00 out of 1.00

Is memory protection useless on a single-user system?

- True
- False ✓

The correct answer is 'False'.

**Question 22**

Correct

Mark 1.00 out of 1.00

Paging - the key in associative memory is:

Select one or more:

- a. frame number
- b. page number ✓
- c. the frame number concatenated with the page number
- d. the page number concatenated with the frame number

Twoja odpowiedź jest poprawna.

The correct answer is: page number

**Question 23**

Correct

Mark 1.00 out of 1.00

What is a scheduler?

Select one or more:

- a. a kernel routine that selects a task to execute ✓
- b. the system process that allocates the processor
- c. procedure that schedules frame release in the page replace algorithm
- d. memory allocation procedure

Twoja odpowiedź jest poprawna.

The correct answer is: a kernel routine that selects a task to execute

**Question 24**

Correct

Mark 1.00 out of 1.00

Using Test-And-Set or Compare-And-Swap in synchronization:

Select one or more:

- a. Stops the processor if 0 is read
- b. It can only be applied in systems with shared memory ✓
- c. Requires organizing inactive waiting in queues
- d. It requires processes to actively wait ✓

Twoja odpowiedź jest poprawna.

The correct answers are: It requires processes to actively wait,  
It can only be applied in systems with shared memory

**Question 25**

Incorrect

Mark 0.00 out of 1.00

System/user threads:

Select one or more:

- a. User-level thread descriptors are stored in the operating system kernel. ❌
- b. User-level threads share the same stack.
- c. User-level threads share the same execution context. ✓

Twoja odpowiedź jest niepoprawna.

The correct answer is: User-level threads share the same execution context.

**Question 26**

Partially correct

Mark 0.75 out of 1.00

The environment in which the process is executed includes:

Select one or more:

- a. Open files
- b. Contents of the interrupt request register
- c. General purpose registers content ✓
- d. Process address space ✓
- e. A set of environment variables ✓
- f. The content in the memory management unit

Twoja odpowiedź jest częściowo poprawna.

You have correctly selected 3.

The correct answers are: A set of environment variables, Process address space, General purpose registers content, Open files

**Question 27**

Correct

Mark 1.00 out of 1.00

The sequence of actions in interrupt handling:

1. saving a copy of the interrupt vector (PC and SR) ✓
2. switching to system mode (modification of PC and status register) ✓
3. programmatic context saving ✓
4. switching to the system stack ✓

Twoja odpowiedź jest poprawna.

The correct answer is:

The sequence of actions in interrupt handling:

- 1.[saving a copy of the interrupt vector (PC and SR)]
- 2.[switching to system mode (modification of PC and status register)]
- 3.[programmatic context saving]
- 4.[switching to the system stack]

**Question 28**

Partially correct

Mark 0.50 out of 1.00

What does the file system layer do?

- a. Manages remote files
- b. Tracks the status of information
- c. Manages remote file systems
- d. Manages files ✓

The correct answers are: Tracks the status of information, Manages files

**Question 29**

Incorrect

Mark 0.00 out of 1.00

When is the scheduler called?

Select one or more:

- a. at the request of a user task
- b. when the scheduler decides itself
- c. at the start of execution of each kernel procedure ✗
- d. at the end of the execution of each kernel procedure

Twoja odpowiedź jest niepoprawna.

The correct answer is: at the end of the execution of each kernel procedure

**Question 30**

Correct

Mark 1.00 out of 1.00

Twins algorithm:

Select one or more:

- a. Causes external fragmentation ✓
- b. Causes less fragmentation than static division into equal blocks ✓
- c. Causes internal fragmentation ✓

Twoja odpowiedź jest poprawna.

The correct answers are: Causes internal fragmentation, Causes external fragmentation, Causes less fragmentation than static division into equal blocks

**Question 31**

Correct

Mark 1.00 out of 1.00

On UNIX, the number of files is directly limited by:

Select one or more:

- a. The size of the space allocated for files ✓
- b. Allocation unit size
- c. The number of bits of the field describing the size of the file
- d. The number of bits of the disk address
- e. FAT size

Twoja odpowiedź jest poprawna.

The correct answer is: The size of the space allocated for files

**Question 32**

Correct

Mark 1.00 out of 1.00

Between fork and exec operations, the following operations are performed:

Select one or more:

- a. Opening the appropriate input/output files ✓
- b. Allocating the appropriate amount of memory for the program being started
- c. Loading the program to be started into memory

Twoja odpowiedź jest poprawna.

The correct answer is: Opening the appropriate input/output files

**Question 33**

Correct

Mark 1.00 out of 1.00

Devices report their readiness by:

Select one or more:

- a. system call
- b. setting a status bit ✓
- c. issuing an interrupt ✓
- d. unblocking the interrupts

Twoja odpowiedź jest poprawna.

The correct answers are: issuing an interrupt, setting a status bit

**Question 34**

Correct

Mark 1.00 out of 1.00

The page fault exception is specific in that:

Select one or more:

- a. execution of the instruction may require decrementing the program counter ✓
- b. is reported in the "middle" of an instruction execution ✓
- c. continuation of the instruction execution may require the saving of internal processor registers storing intermediate values ✓
- d. there is no return to the program from it

Twoja odpowiedź jest poprawna.

The correct answers are: is reported in the "middle" of an instruction execution, execution of the instruction may require decrementing the program counter, continuation of the instruction execution may require the saving of internal processor registers storing intermediate values

**Question 35**

Correct

Mark 1.00 out of 1.00

Two successive executions of operation V in one process on a binary semaphore in down state:

Select one or more:

- a. If the semaphore guards a critical region, it can let two processes enter the critical region ✓
- b. Raises the semaphore if there are no suspended processes ✓
- c. Increases semaphore value by 2
- d. It doesn't change anything

Twoja odpowiedź jest poprawna.

The correct answers are: If the semaphore guards a critical region, it can let two processes enter the critical region, Raises the semaphore if there are no suspended processes

**Question 36**

Correct

Mark 1.00 out of 1.00

Multiprogram systems:

- a. They are only used on large mainframe computers
- b. It does any job faster
- c. It holds more than one program in primary memory at the same time ✓
- d. They are easier to develop than single-program systems

The correct answer is: It holds more than one program in primary memory at the same time

**Question 37**

Incorrect

Mark 0.00 out of 1.00

Multiprogramming is a technique in which, as a rule:

Select one or more:

- a. only addresses that can be generated by the processor when performing calculations are used
- b. is a memory allocation method by which a program is divided into equal parts
- c. is a method of allocating processor time ✗
- d. many programs can be stored in primary memory ✓

Twoja odpowiedź jest niepoprawna.

The correct answer is: many programs can be stored in primary memory

**Question 38**

Correct

Mark 1.00 out of 1.00

The effective address is also:

Select one or more:

- a. Physical address
- b. Absolute address
- c. Indirect address
- d. Logical address ✓

Twoja odpowiedź jest poprawna.

The correct answer is: Logical address

**Question 39**

Correct

Mark 1.00 out of 1.00

Page thrashing is a phenomenon involving:

Select one or more:

- a. frequent downloading of pages that have just been swapped out from memory ✓
- b. frequent context changes that require page index tables to be reloaded
- c. frequently changing the values of bits describing pages in frames
- d. loading the same page over and over again

Twoja odpowiedź jest poprawna.

The correct answer is: frequent downloading of pages that have just been swapped out from memory

**Question 40**

Correct

Mark 1.00 out of 1.00

What mechanism is part of batch systems?

- a. high-level scheduler ✓
- b. low-level scheduler
- c. no scheduler is needed
- d. medium-level scheduler ✓

The correct answers are: high-level scheduler, medium-level scheduler

**Question 41**

Correct

Mark 1.00 out of 1.00

The sweeping mechanism consists in:

Select one or more:

- a. Loading segments into primary memory and sending them to disk ✓
- b. Loading pages into the primary memory and sending them to the disk
- c. Merging adjacent free memory blocks
- d. Moving programs around in memory to eliminate fragmentation

Twoja odpowiedź jest poprawna.

The correct answer is: Loading segments into primary memory and sending them to disk

**Question 42**

Correct

Mark 1.00 out of 1.00

A memory management technique in which the system divides memory into equal-sized chunks with virtual base addresses divisible by a chunk size, to easily manage relocation, is called:

Select one or more:

- a. swapping
- b. mapping
- c. fragmentation
- d. paging ✓

Twoja odpowiedź jest poprawna.

The correct answer is: paging

**Question 43**

Correct

Mark 1.00 out of 1.00

In indulgent scheduling, the process keeps the CPU until:

Select one or more:

- a. next interrupt from the timer
- b. next interrupt from the device
- c. waiving ✓
- d. termination ✓



Twoja odpowiedź jest poprawna.

The correct answers are: waiving, termination

**Question 44**

Correct

Mark 1.00 out of 1.00

Allocation unit for file storage:

- a. must be constant across the disk partition ✓
- b. may vary between partitions ✓
- c. may differ between files in a partition
- d. is any integer multiple of a sector (>0)

The correct answers are: must be constant across the disk partition, may vary between partitions

**Question 45**

Incorrect

Mark 0.00 out of 1.00

Allocation unit for file storage:

- a. may be a variable in a partition
- b. may differ between files on a partition ✗
- c. It should be selected to match the characteristics of the data
- d. must be constant across the disk partition ✓

The correct answer is: must be constant across the disk partition

**Question 46**

Correct

Mark 1.00 out of 1.00

When an exception is raised in user mode, the operating system switches to the kernel system stack, and what happens when an exception is raised in system mode?

Select one or more:

- a. nothing special, it builds the context on the kernel system stack ✓
- b. initializes the kernel system stack from the scratch
- c. switches to the next kernel system stack
- d. switches back to the application program stack

Twoja odpowiedź jest poprawna.

The correct answer is: nothing special, it builds the context on the kernel system stack

**Question 47**

Correct

Mark 1.00 out of 1.00

Conditional variables in a monitor

Select one or more:

- a. They are used to suspend processes that cannot run because the conditions for their continuation are not met ✓
- b. They guard access to the critical region of the monitor
- c. They are used to check whether the conditions for process continuation are met

Twoja odpowiedź jest poprawna.

The correct answer is: They are used to suspend processes that cannot run because the conditions for their continuation are not met

**Question 48**

Correct

Mark 1.00 out of 1.00

By definition, a deadlock is a situation where:

Select one or more:

- a. any greater than zero number of processes are waiting for conditions that cannot be met ✓
- b. any greater than one number of processes are waiting for conditions that cannot be met
- c. at least two processes are waiting for conditions that cannot be met
- d. exactly one process is waiting for a condition that cannot be met

Twoja odpowiedź jest poprawna.

The correct answer is: any greater than zero number of processes are waiting for conditions that cannot be met

**Question 49**

Incorrect

Mark 0.00 out of 1.00

How is exception identification performed?

Select one or more:

- a. all exceptions are specified using the data bus
- b. the specification of hardware interrupts is given over the data bus
- c. the specification of hardware interrupts and traps is given over the data bus ✗
- d. the specification of hardware interrupts and errors is given over the data bus

Twoja odpowiedź jest niepoprawna.

The correct answer is: the specification of hardware interrupts is given over the data bus

**Question 50**

Correct

Mark 1.00 out of 1.00

In a multiprocessor operating system, interrupt blocking is sufficient to prevent the microkernel from executing its routines simultaneously

 True False ✓

nie

The correct answer is 'False'.

**Question 51**

Correct

Mark 1.00 out of 1.00

After performing the mount(/dev/hd5,/usr/x/bin/hd5) operation, the file /usr/z/a on the mounted disk should be referenced by:

Select one or more:

- a. /dev/hd5/usr/z/a
- b. /usr/x/bin/hd5/usr/z/a ✓
- c. /usr/x/bin/dev/hd5/usr/z/a

Twoja odpowiedź jest poprawna.

The correct answer is: /usr/x/bin/hd5/usr/z/a

**Question 52**

Correct

Mark 1.00 out of 1.00

The scheduling goal, which is to occupy processors as efficiently as possible, is:

Select one or more:

- a. response time
- b. productivity
- c. utilization ✓

Twoja odpowiedź jest poprawna.

The correct answer is: utilization

**Question 53**

Correct

Mark 1.00 out of 1.00

When a suspended program is moved to auxiliary memory, its process state is called:

- a. moved out
- b. rinsed out
- c. swept away ✓
- d. exchanged

The correct answer is: swept away

**Question 54**

Correct

Mark 1.00 out of 1.00

Address translation aims to:

Select one or more:

- a. detecting the phenomenon of locality of references
- b. converting a virtual address to a physical one ✓
- c. Generating a "frame error" interrupt when the page is out of memory
- d. converting a physical address to a virtual one

Twoja odpowiedź jest poprawna.

The correct answer is: converting a virtual address to a physical one

**Question 55**

Partially correct

Mark 0.67 out of 1.00

The hardware resources of a computer system are:

Select one or more:

- a. Primary memory ✓
- b. Peripheral devices ✓
- c. Windows on the screen
- d. Processor time

Twoja odpowiedź jest częściowo poprawna.

You have correctly selected 2.

The correct answers are: Processor time, Primary memory, Peripheral devices

**Question 56**

Incorrect

Mark 0.00 out of 1.00

The return from interrupt instruction:

Select one or more:

- a. always jumps to the process that was interrupted
- b. restores the interrupt vector
- c. restores general purpose registers ✗
- d. restores the stack pointer ✗

Twoja odpowiedź jest niepoprawna.

The correct answer is: restores the interrupt vector

**Question 57**

Correct

Mark 1.00 out of 1.00

Dynamic relocation is performed by:

- a. Loader
- b. Linker
- c. Compiler
- d. Special registers (DATUM) ✓

The correct answer is: Special registers (DATUM)

**Question 58**

Incorrect

Mark 0.00 out of 1.00

Cloning a process with a *fork* operation results in (not taking to account the numerical result of *fork*):

Select one or more:

- a. Duplication of code segment, initialization of new data segment and stack segment
- b. Duplication of data segment and stack segment
- c. Duplication of code, data and stack segments ✗

Twoja odpowiedź jest niepoprawna.

The correct answer is: Duplication of data segment and stack segment

**Question 59**

Incorrect

Mark 0.00 out of 1.00

Paging - two-level index tables mode of operation

Select one or more:

- a. The content of a level 1 table element points to a level 2 table ✖
- b. The content of the level 1 table element is concatenated (combined) with the content of the level 2 table element
- c. The content of a level 1 table element points to a level 2 table
- d. The content of a level 1 table element is an index in a level 2 table ✖

Twoja odpowiedź jest niepoprawna.

The correct answer is: The content of a level 1 table element points to a level 2 table

**Question 60**

Correct

Mark 1.00 out of 1.00

Address translation is handled by a unit called (give the abbreviation):

Answer: MMU



The correct answer is: MMU

**Question 61**

Incorrect

Mark 0.00 out of 5.00

What is the average time in the system for tasks in the batch, using SJF algorithm?

task	1	2	3	4
processing time	3.4	5.3	2.3	1.1

Answer: 4.3 ✖

The correct answer is: 5.8

**Question 62**

Correct

Mark 5.00 out of 5.00

In RAID 4, data is placed in Strips that are "scattered" over the data disks, so that each subsequent strip is on the next data disk, modulo the number of disks. For this, there is a parity disk that holds the parity bits of zeroth bits, first bits, second bits, etc., equal-numbered strips divided by the number of data disks, for example, strips 0-3, 4-7, 8-11, etc.:



the start of strips 0,1,2,3 looks like this:

1	1	1	0	0	Parity disk
0	0	0	0	0	Disk 3
1	0	0	1	0	Disk 2
1	0	1	0	1	Disk 1
0	1	1	0	0	Disk 0

In the parity strip, the values are placed so that the parity bit keeps the corresponding strip bits 0-3 even.

Disk 3 has been damaged and reads only 0. After replacing the disk with a new one, what values should be put in the strip on disk 3?

Answer:  ✓

The correct answer is: 10111

**Question 63**

Incorrect

Mark 0.00 out of 5.00

The virtual address consists of 7b page number and 9b offset. The page index table is shown below (index, content). For decimal address 2690, binary 0000 1010 1000 0010, specify the physical address in the form: frame number.offset (as decimal numbers, offset in 3 digits). For example, for a physical address consisting of frame 0 and offset 18, specify 0.018. If there is no physical address for the given virtual address, then -1 should be specified.

7	12
6	0
5	-1
4	4
3	9
2	5
1	-1
0	2

Answer: 2.130 ✖

The correct answer is: -1.000

<b>Started on</b>	Tuesday, 14 May 2024, 3:15 PM
<b>State</b>	Finished
<b>Completed on</b>	Tuesday, 14 May 2024, 4:00 PM
<b>Time taken</b>	44 mins 52 secs
<b>Marks</b>	12.25/60.00
<b>Grade</b>	4.08 out of 20.00 (20.42%)

**Question 1**

Correct

Mark 1.00 out of 1.00

Semaphores are used to solve the problem:

- a. process scheduling
- b. races
- c. mutual exclusion ✓
- d. Belady problem

The correct answer is: mutual exclusion

**Question 2**

Incorrect

Mark 0.00 out of 1.00

When the processor is released, the scheduler selects one of the queued processes:

Select one or more:

- a. suspended
- b. waiting
- c. ready ✓
- d. running ✗

Twoja odpowiedź jest niepoprawna.

The correct answer is: ready

**Question 3**

Incorrect

Mark 0.00 out of 1.00

There are three processes in the system:

- C - calculation process (batch process performing complex calculations lasting several hours),
- T - text editor (user edits text document)
- K - compiler (the user compiles the program, e.g. in C++).

Assign processes to priorities in the operating system from the highest to the lowest priority.

highest	C	
intermediate	T	
lowest	K	

Twoja odpowiedź jest niepoprawna.

The correct answer is:

There are three processes in the system:

- C - calculation process (batch process performing complex calculations lasting several hours),
- T - text editor (user edits text document)
- K - compiler (the user compiles the program, e.g. in C++).

Assign processes to priorities in the operating system from the highest to the lowest priority.

highest [T]

intermediate [K]

lowest [C]

**Question 4**

Correct

Mark 1.00 out of 1.00

Semaphore function is to:

- a. synchronize processes for better CPU utilization
- b. synchronize critical resources to prevent deadlock ✓
- c. memory management
- d. process scheduling

The correct answer is: synchronize critical resources to prevent deadlock

**Question 5**

Correct

Mark 1.00 out of 1.00

At the blocked state is a process that:

Select one or more:

- a. occupies a processor
- b. waits for a processor
- c. waits for an I/O operation to complete ✓
- d. fills the processor idle time

Twoja odpowiedź jest poprawna.

The correct answer is: waits for an I/O operation to complete

**Question 6**

Correct

Mark 1.00 out of 1.00

In the running state, there is a process that:

Select one or more:

- a. waits for an I/O operation to complete
- b. fills the CPU idle time
- c. waits for a processor
- d. occupies a processor ✓

Twoja odpowiedź jest poprawna.

The correct answer is: occupies a processor

**Question 7**

Incorrect

Mark 0.00 out of 1.00

What are the functions of the kernel?

- a. Program management ✗
- b. Memory management ✗
- c. Interrupt handling ✓
- d. File management ✗

The correct answer is: Interrupt handling

**Question 8**

Incorrect

Mark 0.00 out of 1.00

The system stack must provide space for:

Select one or more:

- a. Processor registers in as many copies as there are interrupt lines and possible software interrupts ✗
- b. Processor registers in as many copies as there are interrupt lines +1 ✓
- c. Processor registers in as many copies as there are devices in the system +1
- d. CPU registers

Twoja odpowiedź jest niepoprawna.

The correct answer is: Processor registers in as many copies as there are interrupt lines +1

**Question 9**

Partially correct

Mark 0.33 out of 1.00

Interrupt vector is saved in a case of:

Select one or more:

- a. subroutine call
- b. accepting a non-maskable interrupt
- c. accepting a hardware interrupt ✓
- d. jump with trace

Twoja odpowiedź jest częściowo poprawna.

You have correctly selected 1.

The correct answers are: accepting a hardware interrupt, accepting a non-maskable interrupt, jump with trace

**Question 10**

Incorrect

Mark 0.00 out of 1.00

The environment in which the process is executed includes:

Select one or more:

- a. Open files ✓
- b. Contents of the interrupt request register
- c. General purpose registers content ✓
- d. The content in the memory management unit ✗

Twoja odpowiedź jest niepoprawna.

The correct answers are: General purpose registers content, Open files

**Question 11**

Partially correct

Mark 0.50 out of 1.00

The return from interrupt instruction:

Select one or more:

- a. restores the program counter ✓
- b. restores the conditions register
- c. restores the process stack
- d. causes the processor to switch to a process other than the interrupted one



Twoja odpowiedź jest częściowo poprawna.

You have correctly selected 1.

The correct answers are: restores the program counter, restores the conditions register

**Question 12**

Partially correct

Mark 0.50 out of 1.00

What mechanism is part of batch systems?

- a. low-level scheduler
- b. no scheduler is needed
- c. medium-tevel scheduler
- d. high-level scheduler ✓

The correct answers are: high-level scheduler, medium-tevel scheduler

**Question 13**

Incorrect

Mark 0.00 out of 1.00

Operation V on a raised binary semaphore:

Select one or more:

- a. It is stored in order to be able to perform as many operations P as there were V
- b. Increases semaphore value by 1 ✗
- c. It does not change the value of the semaphore

Twoja odpowiedź jest niepoprawna.

The correct answer is: It does not change the value of the semaphore

**Question 14**

Incorrect

Mark 0.00 out of 1.00

The scheduler decisions take the form:

Select one or more:

- a. change from waiting to active state
- b. change from active to ready state
- c. change from ready to active state ✓
- d. change from waiting to ready state ✗

Twoja odpowiedź jest niepoprawna.

The correct answer is: change from ready to active state

**Question 15**

Incorrect

Mark 0.00 out of 1.00

The multi-level interrupt controller includes:

Select one or more:

- a. Priority encoder ✓
- b. Individual interrupt mask ✓
- c. The register of interrupt being serviced ✗
- d. Collective interrupt mask

Twoja odpowiedź jest niepoprawna.

The correct answers are: Collective interrupt mask, Individual interrupt mask, Priority encoder

**Question 16**

Partially correct

Mark 0.50 out of 1.00

Scheduling aims to optimize:

Select one or more:

- a. reaction time
- b. wait time ✓
- c. processor utilization
- d. system throughput ✓

Twoja odpowiedź jest częściowo poprawna.

You have correctly selected 2.

The correct answers are: processor utilization, system throughput, wait time, reaction time

**Question 17**

Incorrect

Mark 0.00 out of 1.00

Which mechanism is a part of Time-sharing systems?

Select one or more:

- a. no scheduler is needed
- b. Long-Term Scheduler ✗
- c. Medium-Term Scheduler
- d. Short-Term Scheduler ✓



Twoja odpowiedź jest niepoprawna.

The correct answer is:

Short-Term Scheduler

**Question 18**

Correct

Mark 1.00 out of 1.00

When an exception is raised in user mode, the operating system switches to the kernel system stack, and what happens when an exception is raised in system mode?

Select one or more:

- a. initializes the kernel system stack from the scratch
- b. switches back to the application program stack
- c. switches to the next kernel system stack
- d. nothing special, it builds the context on the kernel system stack ✓

Twoja odpowiedź jest poprawna.

The correct answer is: nothing special, it builds the context on the kernel system stack

**Question 19**

Incorrect

Mark 0.00 out of 1.00

The interrupt acceptance sequence consists of (in the sequence):

Select one or more:

- a. identification of the interrupt level, performing a jump with the trace according to the interrupt table, saving the interrupt vector
- b. identification of the interrupt level, performing a jump according to the interrupt table, saving the interrupt vector
- c. identification of the interrupt level, saving the interrupt vector, performing a jump with a trace according to the interrupt table
- d. identification of the interrupt level, saving the interrupt vector, performing a jump according to the interrupt table ✗

Twoja odpowiedź jest niepoprawna.

The correct answer is: identification of the interrupt level, saving the interrupt vector, performing a jump with a trace according to the interrupt table

**Question 20**

Correct

Mark 1.00 out of 1.00

Round-robin scheduling is the best mechanism for:

Select one or more:

- a. every system
- b. system with different classes of tasks
- c. time-sharing system ✓
- d. real-time system

Twoja odpowiedź jest poprawna.

The correct answer is: time-sharing system

**Question 21**

Incorrect

Mark 0.00 out of 1.00

Which scheduler is also called a job planner?

- a. long-term
- b. medium-term
- c. short-term ✗
- d. auxiliary

The correct answer is: long-term

**Question 22**

Incorrect

Mark 0.00 out of 1.00

Which of the following statements applies to the process?

- a. A process is a running program.
- b. A process is defined as a set of resources needed to run a program. ✓
- c. A process is code and data loaded into main memory. ✗
- d. The execution of the process must proceed in a sequential manner.

The correct answers are: A process is a running program., The execution of the process must proceed in a sequential manner., A process is defined as a set of resources needed to run a program.

**Question 23**

Incorrect

Mark 0.00 out of 1.00

Which scheduling is used to organize concurrency?

Select one or more:

- a. preempting ✕
- b. short-term
- c. long-term
- d. medium-term

Twoja odpowiedź jest niepoprawna.

The correct answer is: short-term

**Question 24**

Incorrect

Mark 0.00 out of 1.00

What can happen when a job leaves the critical section and more than 1 task is waiting for the critical section?

Select one or more:

- a. letting both tasks into the critical section ✕
- b. active waiting for a critical section ✕
- c. deadlock waiting for critical section
- d. starvation awaiting a critical section ✓

Twoja odpowiedź jest niepoprawna.

The correct answer is: starvation awaiting a critical section

**Question 25**

Correct

Mark 1.00 out of 1.00

Context switch is:

Select one or more:

- a. calling the kernel of the operating system
- b. switching to the system stack
- c. writing registers to the task stack and retrieving them from another task stack ✓
- d. extracode execution

Twoja odpowiedź jest poprawna.

The correct answer is: writing registers to the task stack and retrieving them from another task stack

**Question 26**

Incorrect

Mark 0.00 out of 1.00

Using the Test-And-Set instruction in synchronization:

Select one or more:

- a. Stops the processor if 0 is read
- b. Requires organizing inactive waiting in queues
- c. Requires the use of semaphores ✗
- d. It requires processes to actively wait

Twoja odpowiedź jest niepoprawna.

The correct answer is: It requires processes to actively wait

**Question 27**

Partially correct

Mark 0.75 out of 1.00

How does the operating system call the task completion subroutine?

- 4. recreates the context programmatically and executes the IRET instruction ✓
- 2. sets the trace in the terminating subroutine to the current position ✓
- 3. recreates the context programmatically and executes the IRET instruction ✗
- 1. builds the frame of the terminating subroutine on the task stack ✓

Twoja odpowiedź jest częściowo poprawna.

You have correctly selected 3.

The correct answer is: 4. → recreates the context programmatically and executes the IRET instruction, 2. → sets the trace in the terminating subroutine to the current position, 3. → builds an interrupt vector on the system stack pointing to the terminating subroutine code, 1. → builds the frame of the terminating subroutine on the task stack

**Question 28**

Correct

Mark 1.00 out of 1.00

Interrupt request register is:

Select one or more:

- a. a register that blocks or unblocks all interrupts
- b. a register where interrupt line states are stored ✓
- c. a register that blocks or unblocks individual interrupts
- d. a combinational circuit that calculates the number of the interrupt received

Twoja odpowiedź jest poprawna.

The correct answer is: a register where interrupt line states are stored

**Question 29**

Correct

Mark 1.00 out of 1.00

What mechanism is part of time-sharing systems?

- a. medium-term scheduler
- b. swapping
- c. short-term scheduler ✓
- d. long-term scheduler

The correct answer is: short-term scheduler

**Question 30**

Partially correct

Mark 0.67 out of 1.00

The environment in which the process is executed includes:

Select one or more:

- a. General purpose registers content
- b. Process address space ✓
- c. Contents of the interrupt request register
- d. A set of environment variables ✓

Twoja odpowiedź jest częściowo poprawna.

You have correctly selected 2.

The correct answers are: A set of environment variables, Process address space, General purpose registers content

**Question 31**

Incorrect

Mark 0.00 out of 5.00

What is the average time in the system for tasks in the batch, using SJF algorithm?

The system is equipped with 4 processors

task	1	2	3	4
processing time	3.6	4.6	2.4	1.2

Answer: 4.35 

The correct answer is: 2.9

**Question 32**

Complete

Mark 0.00 out of 25.00

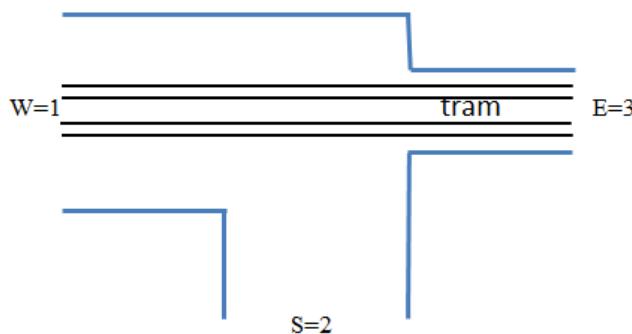
Design a priority semaphore and use it to control traffic at the intersection.

Trams have priority over cars.

Note: tram tracks close to the edge mean that a car cannot fit parallel to a tram, far from the edge means a car can fit.

WSE - direction numbering.

Topography of the intersection:



```
class IntersectionSemaphore:
    def __init__(self):
        self.tram_priority = False # Flag indicating if trams have priority
        self.tram_queue = [] # Queue for trams waiting at the intersection
        self.car_queue = [] # Queue for cars waiting at the intersection

    def tram_arrival(self, direction):
        if not self.tram_priority and not self.car_queue:
            self.tram_priority = True
            self.tram_queue.append(direction)

    def car_arrival(self, direction):
        if self.tram_priority or self.tram_queue:
            self.car_queue.append(direction)

    def tram_departure(self):
        if self.tram_queue:
            self.tram_queue.pop(0)
        if not self.tram_queue:
            self.tram_priority = False

    def car_departure(self):
        if self.car_queue:
            self.car_queue.pop(0)
```

```
def print_intersection_status(self):  
    print("Tram Priority:", self.tram_priority)  
    print("Tram Queue:", self.tram_queue)  
    print("Car Queue:", self.car_queue)
```

```
# Example usage:  
intersection = IntersectionSemaphore()
```

```
# Tram arrives  
intersection.tram_arrival("WSE")
```

```
# Car arrives  
intersection.car_arrival("WSE")
```

```
# Tram departs  
intersection.tram_departure()
```

```
# Car departs  
intersection.car_departure()
```

```
# Print intersection status  
intersection.print_intersection_status()
```

Comment:

A vehicle should not reserve the entire crossing

<b>Started on</b>	Tuesday, 6 May 2025, 3:18 PM
<b>State</b>	Finished
<b>Completed on</b>	Tuesday, 6 May 2025, 3:56 PM
<b>Time taken</b>	38 mins 8 secs
<b>Marks</b>	31.83/50.00
<b>Grade</b>	7.96 out of 12.50 (63.67%)

**Question 1**

Correct

Mark 1.00 out of 1.00

The difference between trap and error is:

Select one or more:

- a. the error is issued by hardware and the trap by software
- b. there is no significant difference
- c. errors are generally reported asynchronously and traps synchronously ✓
- d. after an error, there is usually no return to the program, and after a trap, yes ✓

Twoja odpowiedź jest poprawna.

The correct answers are: after an error, there is usually no return to the program, and after a trap, yes, errors are generally reported asynchronously and traps synchronously

**Question 2**

Correct

Mark 1.00 out of 1.00

In the case of hardware interrupt summation ("wire or"):

Select one or more:

- a. the processor can programmatically poll devices about issuing an interrupt ✓
- b. the interrupt circuit can query devices about issuing an interrupt
- c. the bus driver can poll devices about issuing an interrupt ✓
- d. the interrupt source is identified by a special bus signal

Twoja odpowiedź jest poprawna.

The correct answers are: the processor can programmatically poll devices about issuing an interrupt, the bus driver can poll devices about issuing an interrupt

**Question 3**

Incorrect

Mark 0.00 out of 1.00

Precise interrupts are:

Select one or more:

- a. accepted only in a stable state between the execution of successive instructions ✓
- b. unblocked only in a stable state between the execution of successive instructions ✗
- c. only issued in a stable state between executions of subsequent instructions ✗
- d. transferred only in a stable state between the execution of successive instructions instrukcji ✗

Twoja odpowiedź jest niepoprawna.

The correct answer is: accepted only in a stable state between the execution of successive instructions

**Question 4**

Incorrect

Mark 0.00 out of 1.00

If the loader inserts a program with absolute addresses into a fixed address space, it is called:

- a. Dynamic relocation
- b. Static relocation ✗
- c. Dynamic loading
- d. Static loading

The correct answer is: Dynamic relocation

**Question 5**

Correct

Mark 1.00 out of 1.00

Dynamic relocation requires the use of:

Select one or more:

- a. base register (DATUM) ✓
- b. limit register
- c. status register
- d. program counter

Twoja odpowiedź jest poprawna.

The correct answer is: base register (DATUM)

**Question 6**

Correct

Mark 1.00 out of 1.00

If the compiler prepares a program with absolute addresses to be loaded in a fixed address space, it is called:

- a. Dynamic compiling
- b. Static relocation ✓
- c. Static compiling
- d. Dynamic relocation

The correct answer is: Static relocation

**Question 7**

Partially correct

Mark 0.50 out of 1.00

Dynamic relocation is performed by:

- a. Paging system
- b. Linker
- c. Special registers (DATUM) ✓
- d. Loader

The correct answers are: Special registers (DATUM), Paging system

**Question 8**

Correct

Mark 1.00 out of 1.00

The scheduling goal, which is to occupy processors as efficiently as possible, is:

Select one or more:

- a. response time
- b. utilization ✓
- c. productivity

Twoja odpowiedź jest poprawna.

The correct answer is: utilization

**Question 9**

Incorrect

Mark 0.00 out of 1.00

Which of the following memory allocation schemes can cause external fragmentation?

- a. Multiple contiguous fixed partitions of various sizes ✗
- b. Segmentation ✓
- c. Paging
- d. Multiple contiguous fixed partitions of equal size
- e. Sweeping ✓

The correct answers are: Segmentation, Sweeping

**Question 10**

Partially correct

Mark 0.33 out of 1.00

Onion algorithm:

Select one or more:

- a. Causes external fragmentation
- b. Reduces external fragmentation by aligning the allocation order with the process hierarchy ✓
- c. Causes internal fragmentation

Twoja odpowiedź jest częściowo poprawna.

You have correctly selected 1.

The correct answers are: Causes internal fragmentation, Causes external fragmentation, Reduces external fragmentation by aligning the allocation order with the process hierarchy

**Question 11**

Partially correct

Mark 0.50 out of 1.00

Which of the following memory allocation schemes cause external fragmentation?

- a. Sweeping
- b. Paging
- c. Segmentation ✓
- d. Multiple contiguous fixed partitions of equal size

The correct answers are: Segmentation, Sweeping

**Question 12**

Correct

Mark 1.00 out of 1.00

Context switch is:

Select one or more:

- a. switching to the system stack
- b. writing registers to the task stack and retrieving them from another task stack ✓
- c. extracode execution
- d. calling the kernel of the operating system

Twoja odpowiedź jest poprawna.

The correct answer is: writing registers to the task stack and retrieving them from another task stack

**Question 13**

Correct

Mark 1.00 out of 1.00

The system stack must provide space for:

Select one or more:

- a. CPU registers
- b. Processor registers in as many copies as there are interrupt lines and possible software interrupts
- c. Processor registers in as many copies as there are interrupt lines +1 ✓
- d. Processor registers in as many copies as there are devices in the system +1

Twoja odpowiedź jest poprawna.

The correct answer is: Processor registers in as many copies as there are interrupt lines +1

**Question 14**

Incorrect

Mark 0.00 out of 1.00

What is a scheduler?

Select one or more:

- a. procedure that schedules frame release in the page replace algorithm
- b. memory allocation procedure
- c. a kernel routine that selects a task to execute ✓
- d. the system process that allocates the processor ✗

Twoja odpowiedź jest niepoprawna.

The correct answer is: a kernel routine that selects a task to execute

**Question 15**

Correct

Mark 1.00 out of 1.00

Which of the following applies to user-level threads?

- a. The organization of user-level threads is specific to the operating system.
- b. User-level threads cost no execution time in system mode. ✓
- c. User-level threads require their descriptors in the kernel.
- d. User-level threads can themselves be multi-threaded.

The correct answer is: User-level threads cost no execution time in system mode.

**Question 16**

Correct

Mark 1.00 out of 1.00

The thread is also called:

- a. lightweight process ✓
- b. data process
- c. overlay process
- d. heavy process

The correct answer is: lightweight process

**Question 17**

Partially correct

Mark 0.50 out of 1.00

System/user threads:

Select one or more:

- a. User-level threads share the same stack.
- b. User-level threads share the same execution context.
- c. User-level thread descriptors are stored in the address space of the program. ✓

Twoja odpowiedź jest częściowo poprawna.

You have correctly selected 1.

The correct answers are: User-level thread descriptors are stored in the address space of the program., User-level threads share the same execution context.

**Question 18**

Incorrect

Mark 0.00 out of 1.00

What is the average time in the system for tasks in the batch incoming in this order, using FCFS algorithm?

The system is equipped with 3 processors

task	1	2	3	4
processing time	3.6	6	2.6	1.3

Answer: 3.7 ✘

The correct answer is: 4.0

**Question 19**

Correct

Mark 1.00 out of 1.00

We have the tasks with the following priorities in the access to a resource (a larger number is a higher priority):

Process number	1	2	3	4	5	6
Priority	37	38	29	30	32	25

The scheduling policy is preemptive, with the decision time constraint based on time slicing.

The current process is number 4. What process will get the resource in the nearest decision? Provide its priority.

Answer:

The correct answer is: 38

**Question 20**

Incorrect

Mark 0.00 out of 1.00

What is the average time in the system for tasks in the batch incoming in this order, using FCFS algorithm?

The system is equipped with 4 processors

task	1	2	3	4
processing time	3.2	6.2	2.7	1.6

Answer:

The correct answer is: 3.4

**Question 21**

Correct

Mark 5.00 out of 5.00

page	M	R	belongs to process
1	1	0	4
2	0	0	3
3	1	1	3
4	0	1	2
5	1	0	6
6	1	0	6
7	0	0	5
8	1	1	4

Using the above table of bits M and R for the pages in NRU swapping, with the priority frame allocation rule, which page will be sent to the disk first? The pages are scanned starting from the top. A process number is its priority (the smaller number, the higher priority). The process for which the frame is needed is 4. Provide a page number.

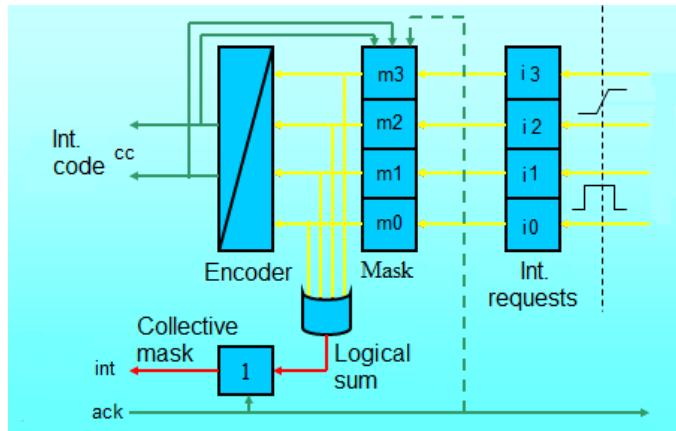
Answer:

The correct answer is: 7

**Question 22**

Incorrect

Mark 0.00 out of 5.00



In the given interrupt controller structure, the interrupt number cc reported to the processor is equal to 0. What will be the form of the interrupt mask (from m3 to m0) after the processor confirms the reception of this interrupt?

The interrupt with index 3 has the highest priority.

Enter the mask in the form .m3m2m1m0 (preceded by a point), for example .0101

If this is not possible, enter -.0001.

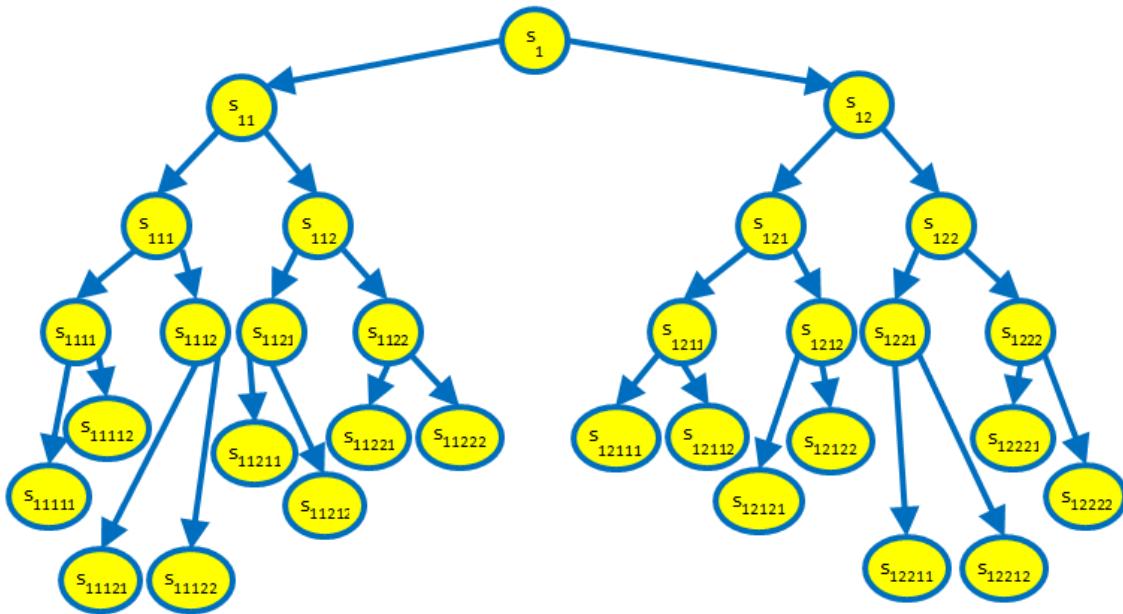
Answer:  ✖

The correct answer is: 0.1110

**Question 23**

Correct

Mark 5.00 out of 5.00



Above is the nesting structure of subroutines in some program. Subroutine s12211 calls its "parent" in the hierarchy. To what stack frame (which subroutine) will the dynamic link be made in the called subroutine frame?

Enter the name of the subroutine with the index, without the letter "s", e.g. for s1112 enter 1112

Answer:  ✓

The correct answer is: 12211

**Question 24**

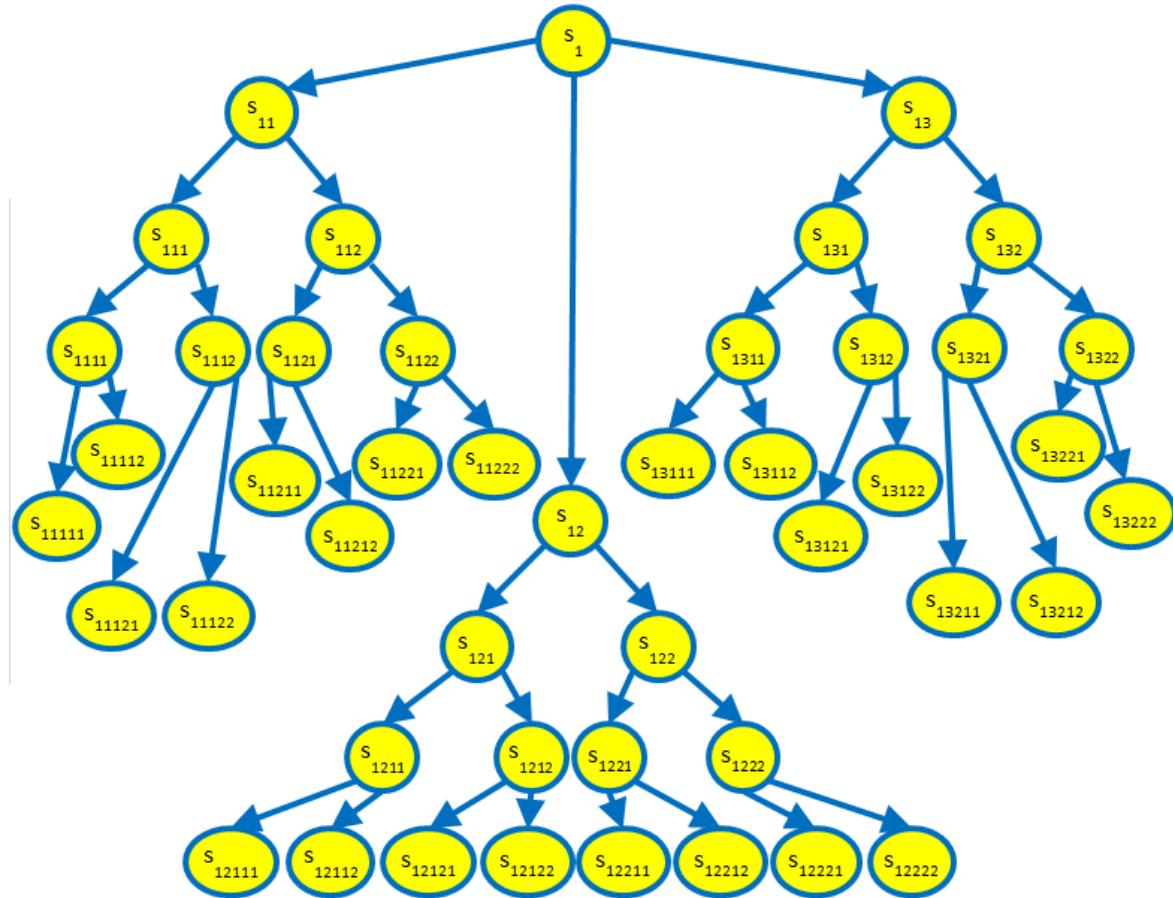
Incorrect

Mark 0.00 out of 5.00

Below is the nesting structure of subroutines in some program.

The stack frame of which subroutine (specify the index) will be pointed by the static link in the frame of the subroutine S1211, that is called from the subroutine S12112?

If the call is not possible, enter index -1.



Answer:  ×

The correct answer is: 121

**Question 25**

Correct

Mark 5.00 out of 5.00

What is the average time in the system for tasks in the batch, using SJF algorithm?

task	1	2	3	4
processing time	3.4	6.4	2.7	1.1

Answer: 6.4 ✓

The correct answer is: 6.4

**Question 26**

Correct

Mark 5.00 out of 5.00

The organization of memory and processor is word-based. A word means 16 bits (int also takes 1 16-bit word). Hexadecimal values are preceded by a # character.

variable a has the value #a0c0

top of the stack (full descending, i.e. the stack pointer points to the most recently put element on the stack, and the stack expands towards lower addresses) #c100

stack frame before subroutine B call #c1010

address of subroutine B #1021

Calling rules: Parameters are put on the stack in accordance with the convention of the C language, i.e. starting from the last one, without a static connection, the result of the function is passed in registers. The stack is shown after subroutine B is called by itself (recursively), at label point C. Subroutine B is called for the first time B(a-2); somewhere in the program from address #1011. Label C has address #1050.

regardless of the programming language, subroutine B has the form

B(int i);

{

    int p=i+1;

    C:     B(i-3);

}

The content of the cell at address #c0ff:  ✓

Address	content	
#c100	????	
#c0ff	#a0be	
#c0fe	#1012	
#c0fd	#c010	
#c0fc	#a0bf	
#c0fb	#a0bb	
#c0fa	#1051	
#c0f9	#c0fd	
#c0f8	#a0bc	
#c0f7	????	
#c0f6	????	

Twoja odpowiedź jest poprawna.

The correct answer is:

The organization of memory and processor is word-based. A word means 16 bits (int also takes 1 16-bit word). Hexadecimal values are preceded by a # character.

variable a has the value #a0c0

top of the stack (full descending, i.e. the stack pointer points to the most recently put element on the stack, and the stack expands towards lower addresses) #c100

stack frame before subroutine B call #c1010

address of subroutine B #1021

Calling rules: Parameters are put on the stack in accordance with the convention of the C language, i.e. starting from the last one, without a static connection, the result of the function is passed in registers. The stack is shown after subroutine B is called by itself (recursively), at label point C. Subroutine B is called for the first time B(a-2); somewhere in the program from address #1011. Label C has address #1050.

regardless of the programming language, subroutine B has the form

```
B(int i);
```

```
{
```

```
    int p=i+1;
```

```
C:    B(i-3);
```

```
}
```

The content of the cell at address #c0ff:[parameter]

Address	content	
#c100	????	
#c0ff	#a0be	
#c0fe	#1012	
#c0fd	#c010	
#c0fc	#a0bf	
#c0fb	#a0bb	
#c0fa	#1051	
#c0f9	#c0fd	
#c0f8	#a0bc	
#c0f7	????	
#c0f6	????	

<b>Started on</b>	Tuesday, 10 June 2025, 12:28 AM
<b>State</b>	Finished
<b>Completed on</b>	Tuesday, 10 June 2025, 12:32 AM
<b>Time taken</b>	4 mins 19 secs
<b>Marks</b>	2.00/4.00
<b>Grade</b>	0.01 out of 0.01 (50%)

**Question 1**

Incorrect

Mark 0.00 out of 1.00

Assuming that memory cells are 8-byte, the page number in the address field is 13 bits, the offset is 12 bits, the frame number is 11 bits, and all entries in the TIS page index table are on an 8-byte word boundary, please specify the maximum size of the physical memory in MB

Answer:

4



The number of frames is 2048 (11 bits), and the frame size is 4096 cells (12-bit address), so the maximum number of cells in physical memory is 8M cells (1023).

Because the cells are 8-byte, the maximum memory size is  $8M \times 8B = 64MB$

The correct answer is: 64

**Question 2**

Incorrect

Mark 0.00 out of 1.00

Assuming that memory cells are 4-byte, the page number in the address field is 13 bits, the offset is 12 bits, the frame number is 11 bits, and all entries in the TIS page index table are on an 8-byte word boundary, please specify the maximum size of the physical memory in MB

Answer:

8



The number of pages is 8096 (13 bits), and the frame size is 4096 cells (12-bit address), so the maximum number of cells in virtual memory is 32M cells ( $2^{25}$ ).

Because the cells are 4-byte, the maximum memory size is  $32M \times 4B = 128MB$

The correct answer is: 128

**Question 3**

Correct

Mark 1.00 out of 1.00

The virtual address consists of 8b page number and 8b offset. The page index table is shown below (index, content). For decimal address 898, binary 0000 0011 1000 0011, enter the physical address in the form: frame number.offset (as decimal numbers, offset in 3 digits ). For example, for a physical address consisting of frame 0 and offset 18, specify 0.018. If there is no physical address for the given virtual address, then -1 should be specified.

3	15
2	0
1	-1
0	-1

Answer: 15.131



The address is divided into 8b page number: 0000 0011, and 8b offset: 1000 0011.

In decimal, they are 3 and 131.

Under index 3, in PIT there is frame number 15. Therefore, the solution is 15.131

The correct answer is: 15.131

**Question 4**

Correct

Mark 1.00 out of 1.00

Assuming that memory cells are 8-byte, the page number in the address field is 13 bits, the offset is 12 bits, the frame number is 11 bits, and all entries in the TIS page index table are on a 4-byte word boundary, please specify the size of the Page Index Table PIT in KB

Answer: 16



The number of pages is 4096 (12 bits), and the PIT cell size is 4 bytes, so the size of PIT is  $4K \times 4B = 16KB$

The correct answer is: 16

<b>Started on</b>	Tuesday, 10 June 2025, 12:13 AM
<b>State</b>	Finished
<b>Completed on</b>	Tuesday, 10 June 2025, 12:22 AM
<b>Time taken</b>	9 mins 4 secs
<b>Marks</b>	3.00/5.00
<b>Grade</b>	0.01 out of 0.01 (60%)

**Question 1**

Incorrect

Mark 0.00 out of 1.00

For the disk operation scheduling Cyclic SCAN method, the currently being executed operation is in 37 cylinder. The direction in the Cyclic SCAN method is descending. The next scheduled operations (in the order of their queuing) are:

Operation number	1	2	3
Cylinder number	48	29	34

Enter the number of the next operation.

Answer: 2



The next operation is in a closest cylinder in the descending direction, that is number 3 - cylinder 27

The correct answer is: 3

**Question 2**

Correct

Mark 1.00 out of 1.00

For the disk operation scheduling Cyclic SCAN method, the currently being executed operation is in 21 cylinder. The direction in the Cyclic SCAN method is ascending. The next scheduled operations (in the order of their queuing) are:

Operation number	1	2	3
Cylinder number	18	29	34

Which disk operation will directly precede the operation on cylinder 18? Provide the number of the operation.

Answer: 3



After executing all operations in cylinders of greater numbers than current (or equal), the head will be moved to the cylinder of the smallest number in the orders (which is 18). The greatest cylinder number in the orders is 34 - order number 3

The correct answer is: 3

**Question 3**

Incorrect

Mark 0.00 out of 1.00

For the disk operation scheduling SCAN method, the currently being executed operation is in 30 cylinder. The direction in the SCAN method is descending. The next scheduled operations (in the order of their queuing) are:

Operation number	1	2	3
Cylinder number	48	21	34

Provide the number of the next operation.

Answer: 3



Because the current direction is descending, the operation will be chosen in the closest cylinder with a smaller (or equal) number: cylinder 21 (number 2).

The correct answer is: 2

**Question 4**

Correct

Mark 1.00 out of 1.00

For the disk operation scheduling SCAN method, the currently being executed operation is in 31 cylinder. The direction in the SCAN method is descending. The next scheduled operations (in the order of their queuing) are:

Operation number	1	2	3
Cylinder number	48	29	34

After which disk operation the current scan direction will change? Provide the number of the operation after which the direction will change.

Answer:

2



All the operations on smaller cylinder numbers will be executed before the direction change. The smallest one is in cylinder 29 - number 2

The correct answer is: 2

**Question 5**

Correct

Mark 1.00 out of 1.00

For the disk operation scheduling SSTF method, the currently being executed operation is in 30 cylinder. The next scheduled operations (in the order of their queuing) are:

Operation number	1	2	3
Cylinder number	48	29	34

Provide the number of the next operation.

Answer:

2



In SSTF, the next operation will be executed in the cylinder closest to the current one: this is cylinder 29 (operation 2).

The correct answer is: 2

<b>Started on</b>	Tuesday, 10 June 2025, 12:04 AM
<b>State</b>	Finished
<b>Completed on</b>	Tuesday, 10 June 2025, 12:12 AM
<b>Time taken</b>	8 mins 23 secs
<b>Marks</b>	5.00/6.00
<b>Grade</b>	8.33 out of 10.00 (83.33%)

**Question 1**

Correct

Mark 1.00 out of 1.00

0

3            0    — →    1

2

page	0	1	2	3
R bit	1	1	0	1

Using the above list for the Clock swapping algorithm, which page will be sent to the disk first? Provide a page number.

The current position of the "arrow" is 1, and the algorithm works clockwise.

Answer:

2



The algorithm starts from the current position - page 1 . It has R=1, so it receives R-9 and the clock hand moves to page 2. It has R=0, so this page is selected for swapping.

The correct answer is: 2

**Question 2**

Incorrect

Mark 0.00 out of 1.00

page nr	1	2	3	4
loaded	6	12	33	56
R bit	1	1	1	0

Using the above list for the FIFO-second chance swapping algorithm, what will be the bottom row after page replacement execution? The middle row is the number of a time slice in which a page was loaded to a frame. Provide a sequence of bits R for the pages; for example, before page replacement, the bottom row has the image 1110. We assume that the loaded page gets R=0.

Answer:

0



The 2-chance algorithm first looks at R in the oldest page (1). It is 1, so this page is moved to the opposite end of the queue, and R is cleared to this page. At this moment the bottom row is 11100. The algorithm continues searching, and finally, it finds page 4 with R=0 and replaces it. The loaded page receives R=0, so the bottom row remains 1100.

The correct answer is: 1100

**Question 3**

Correct

Mark 1.00 out of 1.00

page	history of R
0	11
1	01
2	00
3	10

Using the above table of the history of R bit for the pages in LFU swapping, which page will be sent to the disk first? The oldest bit R is on the left. Provide a page number.

Answer:

2



Page 2 has the smallest number of 1s, so it will be swapped.

The correct answer is: 2

**Question 4**

Correct

Mark 1.00 out of 1.00

		page		
		0	1	2
page	0	0	1	0
	1	0	0	1
	2	1	1	1

Using the above table for hardware-based implementation of LRU swapping, which page will be sent to the disk first? Provide a page number.

Answer:

1



Row 1, interpreted as a binary number (001), is the smallest one, so page 1 will be swapped first.

The correct answer is: 1

**Question 5**

Correct

Mark 1.00 out of 1.00

page	history of R
0	11
1	00
2	01
3	10

Using the above table of the history of R bit for the pages in LRU swapping, which page will be sent to the disk first? The oldest bit R is on the left. Provide a page number.

Answer:

1



Page 1 has the longest number of 0s, so it will be swapped.

The correct answer is: 1

**Question 6**

Correct

Mark 1.00 out of 1.00

page	Last used	Bit R
1	89	1
2	91	0
3	87	0
4	92	0

Using the above table of the history of R bit for the pages in Workset swapping algorithm, which page will be sent to the disk first? The current time slice number is 95, and the time range  $\tau$  for the workset is 5 (the threshold  $95-\tau=90$ ). Page scan starts from the top. Provide a page number to be sent to the disk.

Answer:

3



The first page with R=0 out of the workset is 3 with timestamp 87.

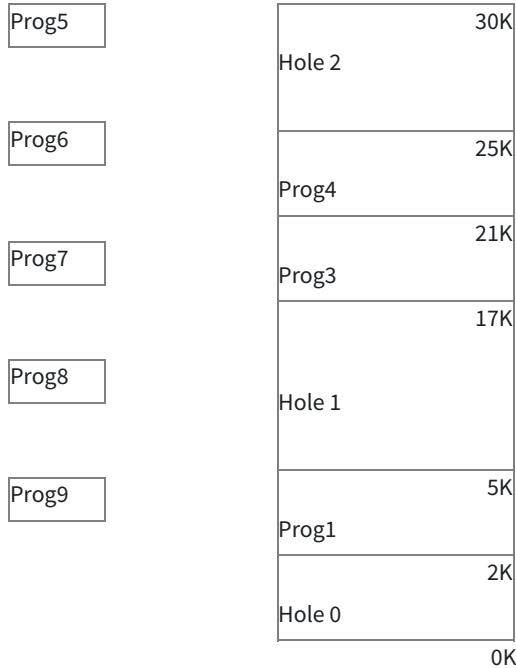
The correct answer is: 3

<b>Started on</b>	Tuesday, 6 May 2025, 11:28 AM
<b>State</b>	Finished
<b>Completed on</b>	Tuesday, 6 May 2025, 11:33 AM
<b>Time taken</b>	5 mins 7 secs
<b>Marks</b>	3.00/7.00
<b>Grade</b>	0.00 out of 0.01 ( <b>42.86%</b> )

**Question 1**

Correct

Mark 1.00 out of 1.00



The numbers on the right are the addresses that finish the program/hole areas, so the area size is the difference between the upper address and the lower address.

In the above memory allocation state, 3 programs are already in memory, and 5 programs are waiting to be loaded into the memory, in the order of their numbers,. The programs waiting to be loaded into memory have the following sizes:

prog5 - 2K  
prog6 - 6K  
prog7 - 4K  
prog8 - 7K  
prog9 - 4K

The memory is allocated to the programs in the first-fit rule, starting from lower addresses, with making a new hole if the allocated block is larger than the demand.

The programs are loaded into the memory in the order of their numbers (from 5 to 9).

Specify, which program will cause the memory compaction. Provide only the program number. If the compaction will not be needed, provide 0.

Answer:

8



Program 5 fits to hole 0, leaving no room.

Program 6 fits to hole 1, reducing this hole to size 6K.

Program 7 fits to hole 1, reducing its size to 2K.

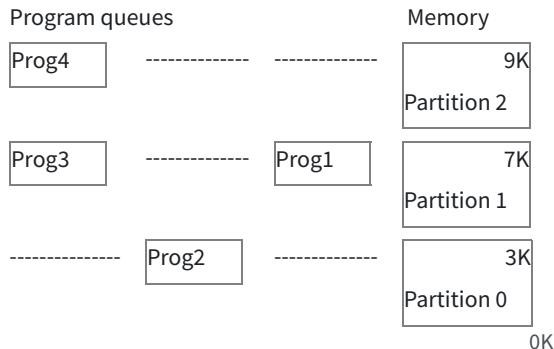
Program 8 does not fit to hole 1 (2K) and to hole 2 (5K), causing the compaction.

The correct answer is: 8

**Question 2**

Incorrect

Mark 0.00 out of 1.00



The numbers on the right are the addresses that finish the partitions, so the partition size is the difference between the upper address and the lower address.

In the above memory division, the programs waiting to be loaded into memory have the following sizes:

prog1 - 4K  
prog2 - 3K  
prog3 - 2K  
prog4 - 4K

The programs are loaded into memory partitions (if possible) in the order of their numbers, from 1 to 4.

Specify, which program will face the internal fragmentation problem as the first. Provide only the program number. If the internal fragmentation cannot occur, enter 0.

Answer:  ✖

Program 1 fits the partition 1 size - no internal fragmentation.

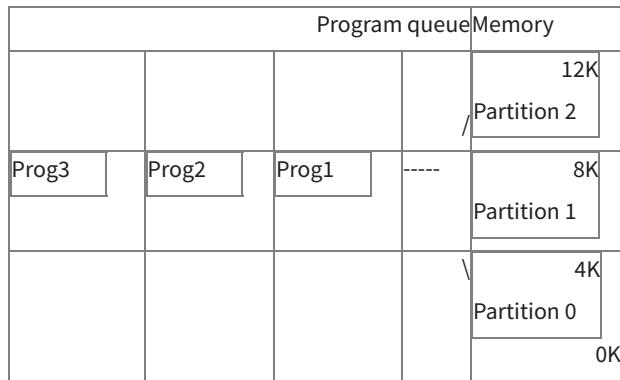
Program 2 is smaller than partition 0 size - it causes internal fragmentation.

The correct answer is: 2

**Question 3**

Correct

Mark 1.00 out of 1.00



The numbers on the right are the addresses that finish the partitions, so the partition size is the difference between the upper address and the lower address.

In the above memory division, the programs waiting to be loaded into memory have the following sizes:

prog1 - 5K  
prog2 - 4K  
prog3 - 3K

Programs are loaded into memory partitions (if possible) in the order of their numbers, from 1 to 3.

Specify, which program will face the internal fragmentation problem as the first. Provide only the program number. If the internal fragmentation cannot occur, enter 0.

Answer:  ✓

Program 1 is greater than the partition size - it will not be executed

Program 2 fits the partition size - no internal fragmentation.

Program 3 is smaller than the partition size - it causes internal fragmentation.

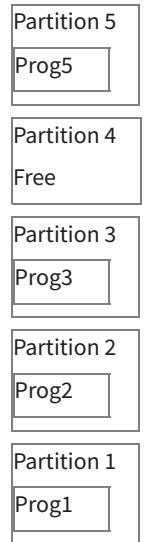
The correct answer is: 3

**Question 4**

Incorrect

Mark 0.00 out of 1.00

## Memory



In the above memory allocation state, partition 4 is a hole, and there are partitions 1...3,5 that are occupied by programs. Starting from the current while, some programs finish their work and release their partitions in the order: prog5, prog3, prog1. Free neighboring partitions are merged.

Specify the first program termination that causes external fragmentation. Provide the number of this program. If external fragmentation will not occur, enter 0.

Answer:

3



Program 5 and Program 3 stick to the free partition, so their partitions are merged with Partition 4.

Partition 1 is distant from the hole (there is Partition 2 in between), so the termination of Program 1 causes a separate hole.

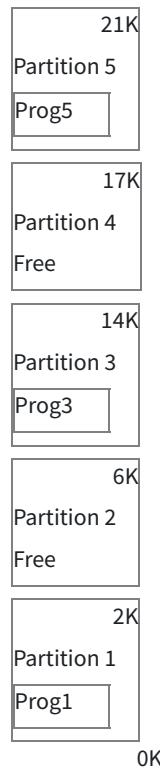
Occurring of two separate memory holes causes eternal fragmentation.

The correct answer is: 1

**Question 5**

Incorrect

Mark 0.00 out of 1.00

**Memory**

The numbers on the right are the addresses that finish the partitions, so the partition size is the difference between the upper address and the lower address.

In the above memory allocation state, 4 programs are already in memory, and 5th program is waiting to be loaded into the memory.

The memory is allocated to the programs in the best-fit rule, without making a new hole if the allocated block is larger than the demand.

What will be the internal fragmentation after loading the program Prog4 of size 2K into memory?

Answer:

2



Both Partition 2 and Partition 4 fit the requirements of Prog4, but Partition 4 has a smaller size, so it will receive the program, and the fragmentation will be 1K (3-2).

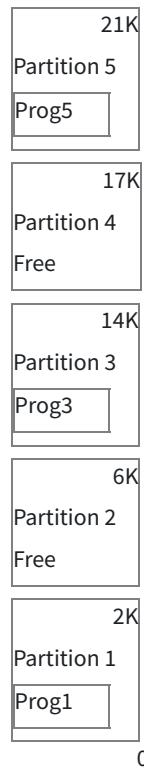
The correct answer is: 1

**Question 6**

Correct

Mark 1.00 out of 1.00

Memory



The numbers on the right are the addresses that finish the partitions, so the partition size is the difference between the upper address and the lower address.

In the above memory allocation state, 4 programs are already in memory, and 5th program is waiting to be loaded into the memory.

The memory is allocated to the programs in the first-fit rule, without making a new hole if the allocated block is larger than the demand. The memory is scanned for the fitting hole starting from the higher addresses.

What will be the internal fragmentation after loading the program Prog4 of size 4K into memory?

Answer:

0



Partition 4 has size 3K, so it is too small. Partition 2 fits the requirement, so the program arrives here. The partition size is equal to the program, so the fragmentation will be 0 (4-4).

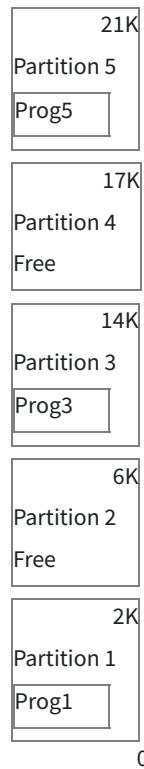
The correct answer is: 0

**Question 7**

Incorrect

Mark 0.00 out of 1.00

Memory



The numbers on the right are the addresses that finish the partitions, so the partition size is the difference between the upper address and the lower address.

In the above memory allocation state, 4 programs are already in memory, and 5th program is waiting to be loaded into the memory.

The memory is allocated to the programs in the worst-fit rule, without making a new hole if the allocated block is larger than the demand.

What will be the internal fragmentation after loading the program Prog4 of size 2K into memory?

Answer:

6



Both Partition 2 and Partition 4 fit the requirements of Prog4, but Partition 4 has a larger size, so it will receive the program, and the fragmentation will be 2K (4-2).

The correct answer is: 2

<b>Started on</b>	Tuesday, 6 May 2025, 10:58 AM
<b>State</b>	Finished
<b>Completed on</b>	Tuesday, 6 May 2025, 11:23 AM
<b>Time taken</b>	24 mins 59 secs
<b>Marks</b>	8.48/10.00
<b>Grade</b>	0.01 out of 0.01 (84.78%)

**Question 1**

Partially correct

Mark 0.54 out of 1.00

We have a buffer of capacity N=70, and two processes of producers A and B. Producer A produces the letter A, and producer B produces the letter B.

Complete the code of the prodA and prodB functions, which will be cyclically called by producer A and producer B, respectively.

Each function call concerns 1 element. Semaphores with initialization, p, v operations should be used.

When using semaphores, it is necessary to ensure synchronization of access to the buffer so that letters are placed in it according to the sequence:

AABBBAABBBAAABBBAAABBB .....

```
binsem mutex = 1, semA = 0; semB = 0;
```

```
int count= 0 ✓ ;countA= 0 ✓ ;countB= 0 ✗ ;
```

```
bool waitA=false, waitB=false;
```

```
void prodA() {
    mutex.P;
    if ((count == N) || ( countA == 2 )) {
        waitA = true;
        mutex.V;
        semA.P;
        waitA = false;
    }
}
```

//produce an element

```
count += 1;
```

```
countA += 1 ✓ ;
```

```
if (waitB && (count<N) && ( countB == 3 )) {
```

```
    countA ✗ = 3 ✗ ;
```

```
    semB.V;
```

```
    mutex.P;
```

```
}
```

```
    mutex.V;
```

```
}
```

```
void prodB() {
```

```

mutex.P;

if ( (count == N) || ( countB == 3 ) ) {

    waitB = true;

    mutex.V;

    semB.P;

    waitB = false;

}

//produce an element

count += 1;

countB += 1 ✓ ;

if (waitA && (count<N) && ( countB == 0 ) ) {

    countA ✓ = -1 ✗ ;

    semA.V;

    mutex.P;

}

mutex.V
}

```

Twoja odpowiedź jest częściowo poprawna.

You have correctly selected 7.

The correct answer is:

We have a buffer of capacity  $N=70$ , and two processes of producers A and B. Producer A produces the letter A, and producer B produces the letter B.

Complete the code of the prodA and prodB functions, which will be cyclically called by producer A and producer B, respectively.

Each function call concerns 1 element. Semaphores with initialization, p, v operations should be used.

When using semaphores, it is necessary to ensure synchronization of access to the buffer so that letters are placed in it according to the sequence:

AABBBAABBBAABBBABBB .....

```
binsem mutex = 1, semA = 0, semB = 0;
```

```
int count=[0]; countA=[0]; countB=[3];
```

```
bool waitA=false, waitB=false;
```

```

void prodA() {

    mutex.P;

    if ( (count == N) || ([countA == 2]) ) {

        waitA = true;

        mutex.V;

        semA.P;
}

```

```
waitA = false;
}

//produce an element
count += 1;
[countA += 1];

if (waitB && (count<N) && ([countA == 2])) {
    [countB] = [0];
    semB.V;
    mutex.P;
}
mutex.V;

}

void prodB() {
    mutex.P;
    if ( (count == N) || ([countB == 3])) {
        waitB = true;
        mutex.V;
        semB.P;
        waitB = false;
    }
    //produce an element
    count += 1;
    [countB += 1];
    if (waitA && (count<N) && ([countB == 3])) {
        [countA] = [0];
        semA.V;
        mutex.P;
    }
    mutex.V;
}
```

**Question 2**

Correct

Mark 1.00 out of 1.00

We have a buffer of capacity N=25, and two processes of producers A and B. Producer A produces the letter A, and producer B produces the letter B.

Complete the code of the prodA and prodB functions, which will be cyclically called by producer A and producer B, respectively.

Each function call concerns 1 element. Semaphores with init, p, v operations should be used.

When using semaphores, it is necessary to ensure synchronization of access to the buffer so that letters are placed in it according to the sequence:

AABBBBAABBBBAABBBBAABBBB .....

```
binsem semA = [1] ✓ , semB = [0] ✓ ;
sem semFull = [25] ✓ , semEmp = [0] ✓ ;
int countA = [0] ✓ , countB = [0] ✓ ;
```

```
void prodA() {
```

```
    semFull.P;
    semA.P;
    //produce an element
```

```
    countA += [1] ✓ ;
    if (countA == [2] ✓ )
    { countB = [0] ✓ ; semB.V; }
```

```
    else
```

```
        semA.V;
        semEmp.V;
```

```
}
```

```
void prodB() {
```

```
    semFull.P;
    semB.P;
    //produce an element
```

```
    countB += [1] ✓ ;
    if (countB == [4] ✓ )
    { countA = [0] ✓ ; semA.V; }
```

```

else

semB.V;

semEmp.V;

}

```

Twoja odpowiedź jest poprawna.

The correct answer is:

We have a buffer of capacity N=25, and two processes of producers A and B. Producer A produces the letter A, and producer B produces the letter B.

Complete the code of the prodA and prodB functions, which will be cyclically called by producer A and producer B, respectively.

Each function call concerns 1 element. Semaphores with init, p, v operations should be used.

When using semaphores, it is necessary to ensure synchronization of access to the buffer so that letters are placed in it according to the sequence:

AABBBBAABBBBAABBBBAABBBB .....

```
binsem semA = [1], semB = [0];
```

```
sem semFull = [25], semEmp = [0];
```

```
int countA = [0], countB = [0];
```

```

void prodA() {
    semFull.P;
    semA.P;
    //produce an element
    countA += [1];
    if (countA == [2])
        { countB = [0]; semB.V; }
    else
        semA.V;
    semEmp.V;
}

```

```

void prodB() {
    semFull.P;
    semB.P;
    //produce an element
    countB += [1];
    if (countB == [4])
        { countA = [0]; semA.V; }
    else
        semB.V;
    semEmp.V;
}

```



**Question 3**

Partially correct

Mark 0.73 out of 1.00

We have a buffer of capacity N=25, and two processes of producers A and B. Producer A produces the letter A, and producer B produces the letter B.

Complete the code of the prodA and prodB functions, which will be cyclically called by producer A and producer B, respectively.

Each function call concerns 1 element. Semaphores with init, p, v operations should be used.

When using semaphores, it is necessary to ensure synchronization of access to the buffer so that letters are placed in it according to the sequence:

AABBBBAABBBBAABBBBAABBBB.....

```
binsem semA = [1] ✓ , semB = [0] ✓ ;
sem semFull = [25] ✓ , semEmp = [0] ✓ ;
int countA = [1] ✗ , countB = 0;
```

```
void prodA() {
```

```
    semFull.P;
```

```
    semA.P;
```

```
    //produce an element
```

```
    countA -= [2] ✗ ;
    if (countA == [1] ✗ )
    { countB = [4] ✓ ; semB.V; }
```

```
    else
```

```
        semA.V;
```

```
        semEmp.V;
```

```
}
```

```
void prodB() {
```

```
    semFull.P;
```

```
    semB.P;
```

```
    //produce an element
```

```
    countB -= [1] ✓ ;
    if (countB == [0] ✓ )
    { countA = [2] ✓ ; semA.V; }
```

```
else  
    semB.V;  
  
semEmp.V;  
}
```

Twoja odpowiedź jest częściowo poprawna.

You have correctly selected 8.

The correct answer is:

We have a buffer of capacity N=25, and two processes of producers A and B. Producer A produces the letter A, and producer B produces the letter B.

Complete the code of the prodA and prodB functions, which will be cyclically called by producer A and producer B, respectively.

Each function call concerns 1 element. Semaphores with init, p, v operations should be used.

When using semaphores, it is necessary to ensure synchronization of access to the buffer so that letters are placed in it according to the sequence:

AABBBBAABBBBAABBBBAABBBB .....

```
binsem semA = [1], semB = [0];  
sem semFull = [25], semEmp = [0];  
int countA = [2], countB = 0;
```

```
void prodA() {
```

```
    semFull.P;  
    semA.P;  
    //produce an element  
    countA -= [1];  
    if (countA == [0])  
    { countB = [4]; semB.V; }  
    else  
        semA.V;  
    semEmp.V;  
}
```

```
void prodB() {
```

```
    semFull.P;  
    semB.P;  
    //produce an element  
    countB -= [1];  
    if (countB == [0])  
    { countA = [2]; semA.V; }  
    else  
        semB.V;  
    semEmp.V;  
}
```



**Question 4**

Partially correct

Mark 0.53 out of 1.00

We have a buffer of capacity  $N=70$ , and two processes of producers A and B. Producer A produces the letter A, and producer B produces the letter B.

Complete the code of the prodA and prodB functions, which will be cyclically called by producer A and producer B, respectively.

Each function call concerns 1 element. Semaphores with initialization, P and V operations should be used.

When using semaphores, it is necessary to ensure synchronization of access to the buffer so that letters are placed in it according to the sequence:

AABBAABBAABBAABB .....

binsem mutex =  ✓ , semA =  ✗ ; semB =  ✓ ;

int count = 0; countA = 0, countB = 3;

bool waitA=false, waitB=false;

void prodA() {

✓ ;

if ( (count == N) || (countA == 2) ) {

waitA = true;

✗ ;

✗ ;

waitA = false;

}

//produce an element

count += 1;

countA += 1;

if (waitB && (count>N) && (countA == 2) ) {

countB=0;

✗ ;

✗ ;

}

✗ ;

}

void prodB() {

```

mutex.P ✓ ;
if( (count == N) || (countB == 3)) {
    waitB = true;
    mutex.P ✗ ;
    mutex.V ✓ ;
    waitB = false;
}

//produce an element

count += 1;
countB += 1;

if (waitA && (count<N) && (countB == 3)) {
    countA = 0;
    semA.V ✓ ;
    mutex.P ✓ ;
}

mutex.V ✓ ;
}

```

Twoja odpowiedź jest częściowo poprawna.

You have correctly selected 8.

The correct answer is:

We have a buffer of capacity  $N=70$ , and two processes of producers A and B. Producer A produces the letter A, and producer B produces the letter B.

Complete the code of the prodA and prodB functions, which will be cyclically called by producer A and producer B, respectively.

Each function call concerns 1 element. Semaphores with initialization, P and V operations should be used.

When using semaphores, it is necessary to ensure synchronization of access to the buffer so that letters are placed in it according to the sequence:

AABBAABBAABBAABB .....

```

binsem mutex = [1], semA = [0]; semB = [0];
int count = 0; countA = 0, countB = 3;
bool waitA=false, waitB=false;

```

```

void prodA() {
    [mutex.P];
    if( (count == N) || (countA == 2)) {
        waitA = true;
        [semA.P];
        [mutex.V];
    }
}

```

```
waitA = false;  
}  
//produce an element  
count += 1;  
countA += 1;  
if (waitB && (count>N) && (countA == 2)) {  
    countB=0;  
    [semB.V];  
    [mutex.P];  
}  
[mutex.V];  
}  
  
void prodB() {  
    [mutex.P];  
    if ( (count == N) || (countB == 3)) {  
        waitB = true;  
        [semB.P];  
        [mutex.V];  
        waitB = false;  
    }  
    //produce an element  
    count += 1;  
    countB += 1;  
    if (waitA && (count<N) && (countB == 3)) {  
        countA = 0;  
        [semA.V];  
        [mutex.P];  
    }  
    [mutex.V];  
}
```

**Question 5**

Partially correct

Mark 0.93 out of 1.00

We have a buffer of capacity N=60, and two processes of producers A and B. Producer A produces the letter A, and producer B produces the letter B.

Complete the code of the prodA and prodB functions, which will be cyclically called by producer A and producer B, respectively.

Each function call concerns 1 element. Semaphores with initialization, P and V operations should be used.

When using semaphores, it is necessary to ensure synchronization of access to the buffer so that letters are placed in it according to the sequence:

AABBAABBAABBAABB .....

```
binsem mutex = 1, semA = 0; semB = 0;
```

```
int count = 0; countA = 0 ✓ ; countB=2;
```

```
bool waitA = false ✓ , waitB=false;
```

```
void prodA() {
```

```
    mutex.P;
```

```
    if ( (count == N) && (countA == 2) ✗ ) {
```

```
        waitA = true ✓ ;
```

```
        mutex.V;
```

```
        semA.P;
```

```
        waitA = false ✓ ;
```

```
}
```

```
//produce an element
```

```
    count += 1;
```

```
    countA += 1 ✓ ;
```

```
    if ( waitB && (N>count) && (countA == 2) ✓ ) {
```

```
        countB == 0 ✓ ;
```

```
        semB.V;
```

```
        mutex.P;
```

```
}
```

```
        mutex.V;
```

```
}
```

```
void prodB() {
```

```
mutex.P;
```

```
if( (count == N) || (countB == 2) ) { ✓ }
```

```
    waitB = true; ✓ ;
```

```
mutex.V;
```

```
semB.P;
```

```
    waitB = false; ✓ ;
```

```
}
```

```
//produce an element
```

```
count += 1;
```

```
    countB += 1; ✓ ;
```

```
if( waitA && (N>count) && (countB == 2) ) { ✓ }
```

```
    countA = 0; ✓ ;
```

```
semA.V;
```

```
mutex.P;
```

```
}
```

```
mutex.V;
```

```
}
```

Twoja odpowiedź jest częściowo poprawna.

You have correctly selected 13.

The correct answer is:

We have a buffer of capacity N=60, and two processes of producers A and B. Producer A produces the letter A, and producer B produces the letter B.

Complete the code of the prodA and prodB functions, which will be cyclically called by producer A and producer B, respectively.

Each function call concerns 1 element. Semaphores with initialization, P and V operations should be used.

When using semaphores, it is necessary to ensure synchronization of access to the buffer so that letters are placed in it according to the sequence:

AABBAABBAABBAABB .....

binsem mutex = 1, semA = 0; semB = 0;

int count = 0; [countA = 0]; countB=2;

bool [waitA = false], waitB=false;

```
void prodA() {
```

```
    mutex.P;
```

```
    if ((count == N) || (countA == 2)) {
```

```
        [waitA = true];
```

```
        mutex.V;
```

```
        semA.P;
```

```
[waitA = false];
}

//produce an element
count += 1;
[countA += 1];
if ([waitB && (N>count) && (countA == 2)]) {
    [countB == 0];
    semB.V;
    mutex.P;
}
mutex.V;
}

void prodB() {
    mutex.P;
    if ((count == N) || (countB == 2)) {
        [waitB = true];
        mutex.V;
        semB.P;
        [waitB = false];
    }
    //produce an element
    count += 1;
    [countB += 1];
    if ([waitA && (N>count) && (countB == 2)]) {
        [countA = 0];
        semA.V;
        mutex.P;
    }
    mutex.V;
}
```

**Question 6**

Correct

Mark 1.00 out of 1.00

We have a buffer of capacity N=20, and two processes of producers A and B. Producer A produces the letter A, and producer B produces the letter B.

Complete the code of the prodA and prodB functions, which will be cyclically called by producer A and producer B, respectively.

Each function call concerns 1 element. Semaphores with init, p, v operations should be used.

When using semaphores, it is necessary to ensure synchronization of access to the buffer so that letters are placed in it according to the sequence:

AABBAABBAABBAABB .....

binsem semA = 1, semB = 0;

sem semFull = 20, semEmp = 0;

int countA = 0, countB = 0;

```
void prodA() {  
    semFull.P ✓ ;  
    semA.P ✓ ;  
    //produce an element  
    countA += 1;  
    if (countA == 2)  
    { countB = 0; semB.V ✓ ; }  
    else  
        semA.V ✓ ;  
        semEmp.V ✓ ;  
}
```

```
void prodB() {  
    semFull.P ✓ ;  
    semB.P ✓ ;  
    //produce an element  
    countB += 1;  
    if (countB == 2)  
    { countA = 0; semA.V ✓ ; }  
    else
```

```
    semB.V ✓ ;  
    semEmp.V ✓ ;  
}
```

Twoja odpowiedź jest poprawna.

The correct answer is:

We have a buffer of capacity N=20, and two processes of producers A and B. Producer A produces the letter A, and producer B produces the letter B.

Complete the code of the prodA and prodB functions, which will be cyclically called by producer A and producer B, respectively.

Each function call concerns 1 element. Semaphores with init, p, v operations should be used.

When using semaphores, it is necessary to ensure synchronization of access to the buffer so that letters are placed in it according to the sequence:

AABBAABBAABBAABB .....

```
binsem semA = 1, semB = 0;  
sem semFull = 20, semEmp = 0;  
int countA = 0, countB = 0;
```

```
void prodA() {  
    [semFull.P];  
    [semA.P];  
    //produce an element  
    countA += 1;  
    if (countA == 2)  
    { countB = 0; [semB.V]; }  
    else  
        [semA.V];  
    [semEmp.V];  
}
```

```
void prodB() {  
    [semFull.P];  
    [semB.P];  
    //produce an element  
    countB += 1;  
    if (countB == 2)  
    { countA = 0; [semA.V]; }  
    else  
        [semB.V];  
    [semEmp.V];  
}
```

**Question 7**

Correct

Mark 1.00 out of 1.00

We have a buffer of capacity N=50, and two processes of producers A and B. Producer A produces the letter A, and producer B produces the letter B.

Complete the code of the prodA and prodB functions, which will be cyclically called by producer A and producer B, respectively.

Each function call concerns 1 element. Semaphores with init, p, v operations should be used.

When using semaphores, it is necessary to ensure synchronization of access to the buffer so that letters are placed in it according to the sequence:

AABBAABBAABBAABB .....

```
binsem semA = 1, semB = 0;
```

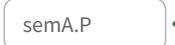
```
sem semFull = 50, semEmp = 0;
```

```
int countA = 2, countB = 0;
```

```
void prodA() {
```



```
    semFull.P ✓ ;
```



```
    semA.P ✓ ;
```

//produce an element

```
    countA -= 1;
```

```
    if (countA == 0)
```

```
        { countB = 2; semB.V ✓ ; }
```

```
    else
```



```
        semA.V ✓ ;
```



```
        semEmp.V ✓ ;
```

```
}
```

```
void prodB() {
```



```
    semFull.P ✓ ;
```



```
    semB.P ✓ ;
```

//produce an element

```
    countB -= 1;
```

```
    if (countB == 0)
```

```
        { countA = 2; semA.V ✓ ; }
```

```
    else
```

```
    semB.V ✓ ;  
    semEmp.V ✓ ;  
}
```

Twoja odpowiedź jest poprawna.

The correct answer is:

We have a buffer of capacity N=50, and two processes of producers A and B. Producer A produces the letter A, and producer B produces the letter B.

Complete the code of the prodA and prodB functions, which will be cyclically called by producer A and producer B, respectively.

Each function call concerns 1 element. Semaphores with init, p, v operations should be used.

When using semaphores, it is necessary to ensure synchronization of access to the buffer so that letters are placed in it according to the sequence:

AABBAABBAABBAABB .....

```
binsem semA = 1, semB = 0;  
sem semFull = 50, semEmp = 0;  
int countA = 2, countB = 0;
```

```
void prodA() {  
    [semFull.P];  
    [semA.P];  
    //produce an element  
    countA -= 1;  
    if (countA == 0)  
    { countB = 2; [semB.V]; }  
    else  
        [semA.V];  
    [semEmp.V];  
}
```

```
void prodB() {  
    [semFull.P];  
    [semB.P];  
    //produce an element  
    countB -= 1;  
    if (countB == 0)  
    { countA = 2; [semA.V]; }  
    else  
        [semB.V];  
    [semEmp.V];  
}
```

**Question 8**

Partially correct

Mark 0.92 out of 1.00

We have a buffer of capacity N=30, and two processes of producers A and B. Producer A produces the letter A, and producer B produces the letter B.

Complete the code of the prodA and prodB functions, which will be cyclically called by producer A and producer B, respectively.

Each function call concerns 1 element. Semaphores with init, p, v operations should be used.

When using semaphores, it is necessary to ensure synchronization of access to the buffer so that letters are placed in it according to the sequence:

ABBBABBBABBBABBB ....

```
binsem semA = 1, semB = 0;
```

```
sem semFull = 30, semEmp = 0;
```

```
int countA = 0, countB = 0;
```

```
void prodA() {
```

semFull.P ✓ ;

semA.P ✓ ;

//produce an element

```
countA += 1;
```

if ( countA==0 ✗ )

{ countB = 0;  semB.V ✓ ; }

else

semA.V ✓ ;

semEmp.V ✓ ;

}

```
void prodB() {
```

semFull.P ✓ ;

semB.P ✓ ;

//produce an element

```
countB += 1;
```

if ( countB==3 ✓ )

{ countA = 0;  semA.V ✓ ; }

```

else
    semB.V ✓ ;
    semEmp.V ✓ ;
}

```

Twoja odpowiedź jest częściowo poprawna.

You have correctly selected 11.

The correct answer is:

We have a buffer of capacity N=30, and two processes of producers A and B. Producer A produces the letter A, and producer B produces the letter B.

Complete the code of the prodA and prodB functions, which will be cyclically called by producer A and producer B, respectively.

Each function call concerns 1 element. Semaphores with init, p, v operations should be used.

When using semaphores, it is necessary to ensure synchronization of access to the buffer so that letters are placed in it according to the sequence:

ABBBABBBABBBABBB ....

```

binsem semA = 1, semB = 0;
sem semFull = 30, semEmp = 0;
int countA = 0, countB = 0;

```

```
void prodA() {
```

```

[semFull.P];
[semA.P];
//produce an element
countA += 1;
if ([true])
{ countB = 0; [semB.V]; }
else
[semA.V];
[semEmp.V];
}
```

```
void prodB() {
```

```

[semFull.P];
[semB.P];
//produce an element
countB += 1;
if ([countB==3])
{ countA = 0; [semA.V]; }
else
[semB.V];
[semEmp.V];
}
```



**Question 9**

Partially correct

Mark 0.92 out of 1.00

We have a buffer of capacity  $N=45$ , and two processes of producers A and B. Producer A produces the letter A, and producer B produces the letter B.

Complete the code of the prodA and prodB functions, which will be cyclically called by producer A and producer B, respectively.

Each function call concerns 1 element. Semaphores with init, p, v operations should be used.

When using semaphores, it is necessary to ensure synchronization of access to the buffer so that letters are placed in it according to the sequence:

ABBBABBBABBBABBB ....

```
binsem semA = 1, semB = 0;
```

```
sem semFull = 45, semEmp = 0;
```

```
int countA = 1, countB = 0;
```

```
void prodA() {
```

semFull.P ✓ ;

semA.P ✓ ;

//produce an element

```
countA -= 1;
```

if ( countA==1 ✗ )

{ countB = 3;  semB.V ✓ ; }

else

semA.V ✓ ;

semEmp.V ✓ ;

```
}
```

```
void prodB() {
```

semFull.P ✓ ;

semB.P ✓ ;

//produce an element

```
countB -= 1;
```

if ( countB==0 ✓ )

{ countA = 1;  semA.V ✓ ; }

```

else
    semB.V ✓ ;
    semEmp.V ✓ ;
}

```

Twoja odpowiedź jest częściowo poprawna.

You have correctly selected 11.

The correct answer is:

We have a buffer of capacity N=45, and two processes of producers A and B. Producer A produces the letter A, and producer B produces the letter B.

Complete the code of the prodA and prodB functions, which will be cyclically called by producer A and producer B, respectively.

Each function call concerns 1 element. Semaphores with init, p, v operations should be used.

When using semaphores, it is necessary to ensure synchronization of access to the buffer so that letters are placed in it according to the sequence:

ABBBABBBABBBABBB ....

```

binsem semA = 1, semB = 0;
sem semFull = 45, semEmp = 0;
int countA = 1, countB = 0;

```

void prodA() {

```

[semFull.P];
[semA.P];
//produce an element

```

```

countA -= 1;

```

```

if ([true])

```

```

{ countB = 3; [semB.V]; }

```

```

else

```

```

[semA.V];

```

```

[semEmp.V];

```

```

}

```

void prodB() {

```

[semFull.P];

```

```

[semB.P];

```

```

//produce an element

```

```

countB -= 1;

```

```

if ([countB==0])

```

```

{ countA = 1; [semA.V]; }

```

```

else

```

```

[semB.V];

```

```

[semEmp.V];

```

```

}

```



**Question 10**

Partially correct

Mark 0.92 out of 1.00

We have a buffer of capacity  $N=20$ , and two processes of consumers A and B. Consumer A consumes the letter A, and consumer B consumes the letter B.

Complete the code of the consA and consB functions, which will be cyclically called by consumer A and consumer B, respectively.

Each function call concerns 1 element. Semaphores with initialization, p, v operations should be used.

When using semaphores, it is necessary to ensure synchronization of access to the buffer so that letters are retrieved in it according to the sequence:

BAABAABAABAA .....

```
binsem semA = 0, semB = 1;
```

```
sem semFull = 20, semEmp = 0;
```

```
int countA = 0, countB = 0;
```

```
void consA() {
```

```
    semEmp.P ;
```

```
    semA.P ;
```

//consume an element

```
    countA += 1;
```

```
    if( countA==2 )
```

```
    { countB = 0; semB.V ; }
```

else

```
    semA.V ;
```

```
    semFull.V ;
```

```
}
```

```
void consB() {
```

```
    semEmp.P ;
```

```
    semB.P ;
```

//consume an element

```
    countB += 1;
```

```
    if( countB==2 )
```

```
    { countA = 0; semA.V ; }
```

```

else
    semB.V ✓ ;
    semFull.V ✓ ;
}

```

Twoja odpowiedź jest częściowo poprawna.

You have correctly selected 11.

The correct answer is:

We have a buffer of capacity N=20, and two processes of consumers A and B. Consumer A consumes the letter A, and consumer B consumes the letter B.

Complete the code of the consA and consB functions, which will be cyclically called by consumer A and consumer B, respectively.

Each function call concerns 1 element. Semaphores with initialization, p, v operations should be used.

When using semaphores, it is necessary to ensure synchronization of access to the buffer so that letters are retrieved in it according to the sequence:

BAABABAABAA .....

```

binsem semA = 0, semB = 1;
sem semFull = 20, semEmp = 0;
int countA = 0, countB = 0;

```

```

void consA() {
    [semEmp.P];
    [semA.P];
    //consume an element
    countA += 1;
    if ([countA==2])
        { countB = 0; [semB.V]; }
    else
        [semA.V];
    [semFull.V];
}

```

```

void consB() {
    [semEmp.P];
    [semB.P];
    //consume an element
    countB += 1;
    if ([true])
        { countA = 0; [semA.V]; }
    else
        [semB.V];
    [semFull.V];
}

```



<b>Started on</b>	Tuesday, 6 May 2025, 10:20 AM
<b>State</b>	Finished
<b>Completed on</b>	Tuesday, 6 May 2025, 10:24 AM
<b>Time taken</b>	3 mins 30 secs
<b>Marks</b>	3.00/5.00
<b>Grade</b>	0.01 out of 0.01 (60%)

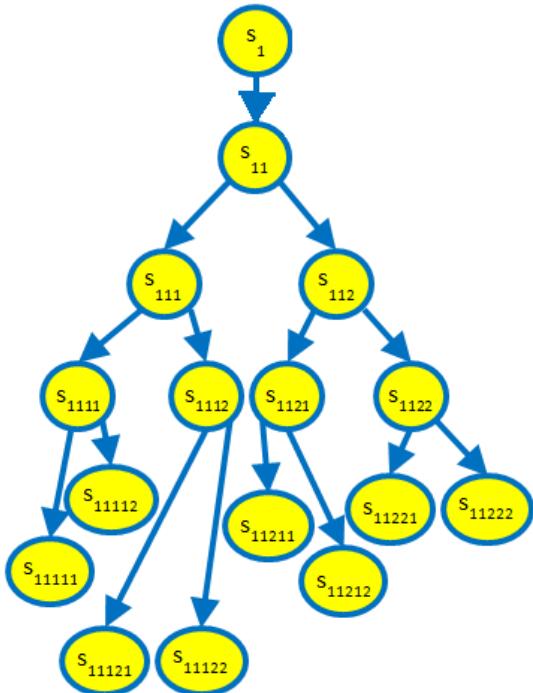
**Question 1**

Incorrect

Mark 0.00 out of 1.00

The following figure shows the static nesting structure of subroutines. Subroutine s11211 makes a call to the subroutine that is its "parent" in the hierarchy. To what stack frame (of which subroutine) will the dynamic link be made in the frame of the called subroutine?

Enter the name of the subroutine with the index, without the letter "s", e.g. for s1122 enter 1122



Answer:  ×

The dynamic link points always to the calling subroutine, so the solution is 11211.

The correct answer is: 11211

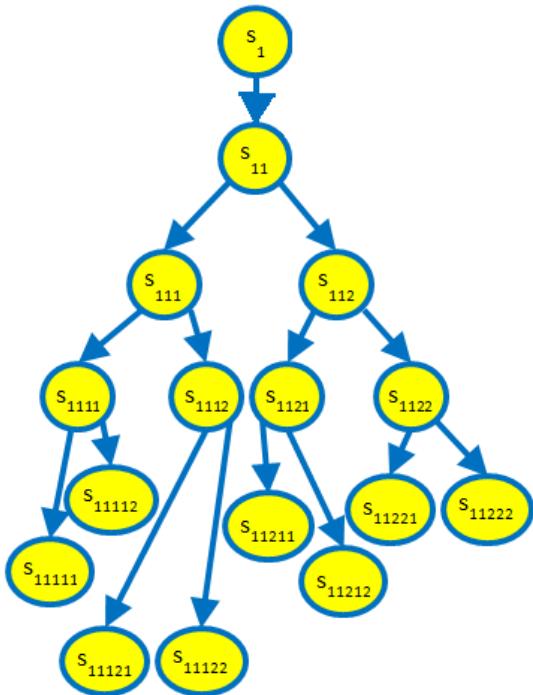
**Question 2**

Correct

Mark 1.00 out of 1.00

The following figure shows the static nesting structure of subroutines. In the stack frame of the subroutine s11221, can there be a dynamic link to the frame of the subroutine s11222?

answer 0-not, 1-yes



Answer:



From a subroutine, only its ancestors and children of its ancestors can be called. So, the subroutine s11222 cannot call the subroutine s11211 and the solution is 0.

The correct answer is: 0

**Question 3**

Incorrect

Mark 0.00 out of 1.00

The following figure shows the static nesting of subroutines. In the stack frame of the subroutine s112 can there be a dynamic link to the frame of the subroutine s11111?

answer 0-not, 1-yes



Answer:



From a subroutine, only its ancestors and children of its ancestors can be called. So, the subroutine s11111 can call the subroutine s112 and the solution is 1

The correct answer is: 1

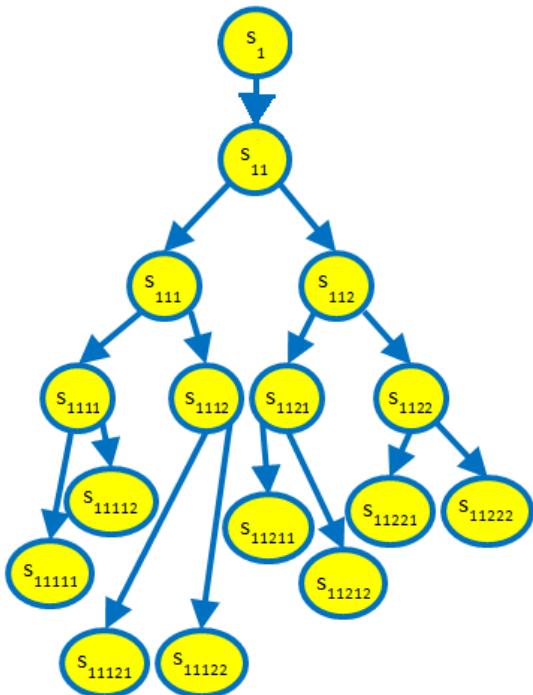
**Question 4**

Correct

Mark 1.00 out of 1.00

The figure shows the static nesting of subroutines. In the stack frame of the subroutine s112 can there be a dynamic link to the frame of the subroutine s111?

answer 0-not, 1-yes



Answer:



From a subroutine, only its ancestors and children of its ancestors can be called. So, the subroutine s111 cannot call the subroutine s112 and the solution is 0

The correct answer is: 0

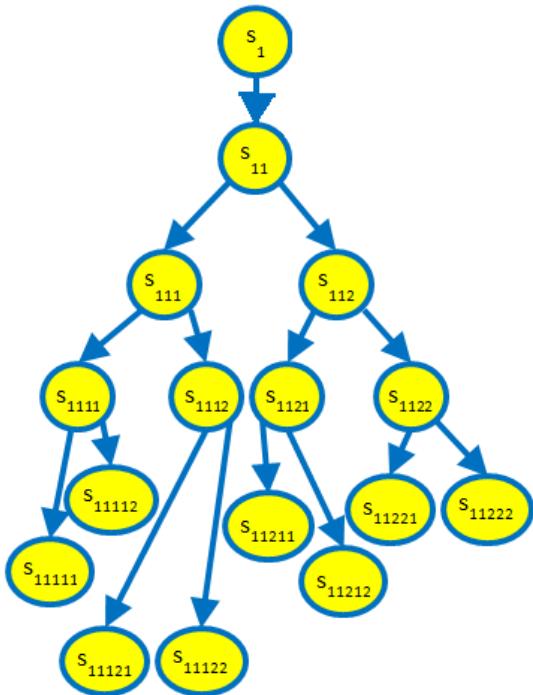
**Question 5**

Correct

Mark 1.00 out of 1.00

The following figure shows the static nesting structure of subroutines. Subroutine s11 makes a recursive call. To what stack frame (of which subroutine) will the dynamic link be made in the recursively called subroutine frame?

Enter the name of the subroutine with the index, without the letter "s", e.g. for s11122 enter 11122



Answer:

11



A dynamic points always to the stack frame of the calling subroutine, so in a recursive call it points to the stack frame of the previous incarnation of the same subroutine on the stack. In this case, s11

The correct answer is: 11

<b>Started on</b>	Tuesday, 6 May 2025, 10:30 AM
<b>State</b>	Finished
<b>Completed on</b>	Tuesday, 6 May 2025, 10:33 AM
<b>Time taken</b>	3 mins 13 secs
<b>Marks</b>	1.00/7.00
<b>Grade</b>	0.00 out of 0.01 (14.29%)

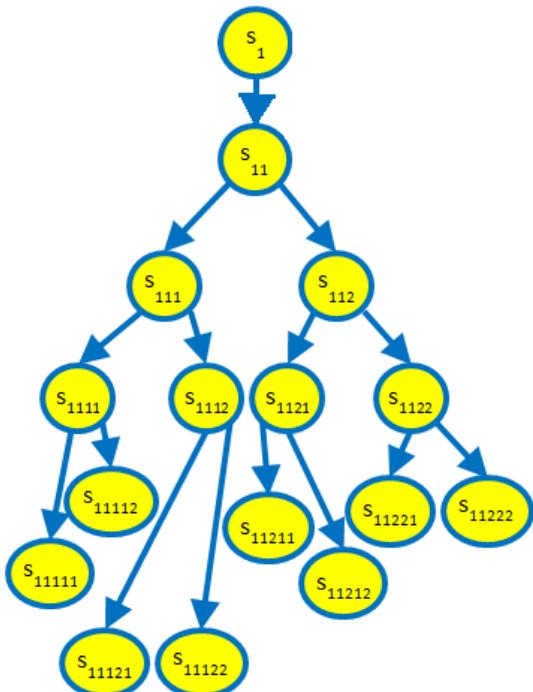
**Question 1**

Incorrect

Mark 0.00 out of 1.00

The following graph shows the static nesting structure of subprograms in a particular program.

The subroutine S111 is called from the subroutine S1111. In the frame of the S111 subroutine, the static link will be set to the frame of which subroutine (give the index)? If the call is impossible, enter index -1.



Answer: 1121



The static link points always to the parent of the called subroutine, so the solution is 11

The correct answer is: 11

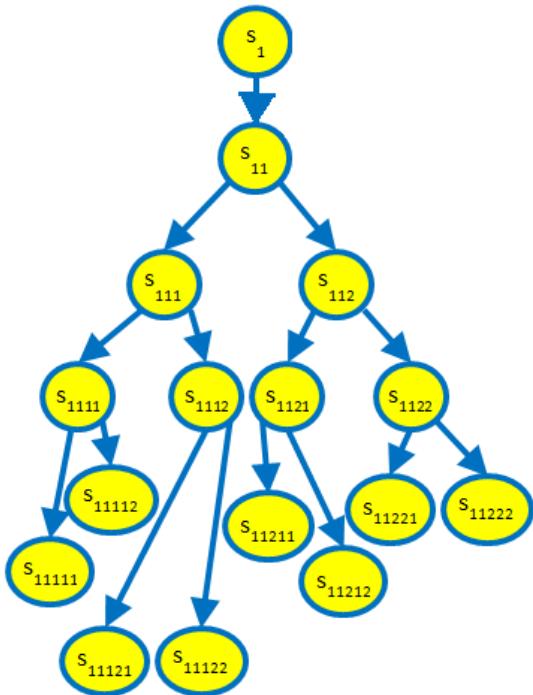
**Question 2**

Incorrect

Mark 0.00 out of 1.00

The following graph shows the static nesting structure of subprograms in a particular program.

The subroutine S111 is called from the subroutine S11. In the frame of the S111 subroutine, the static link will be set to the frame of which subroutine (give the index)? If the call is impossible, enter index -1.



Answer:  ×

The static link points always to the parent of the called subroutine, so the solution is 11

The correct answer is: 11

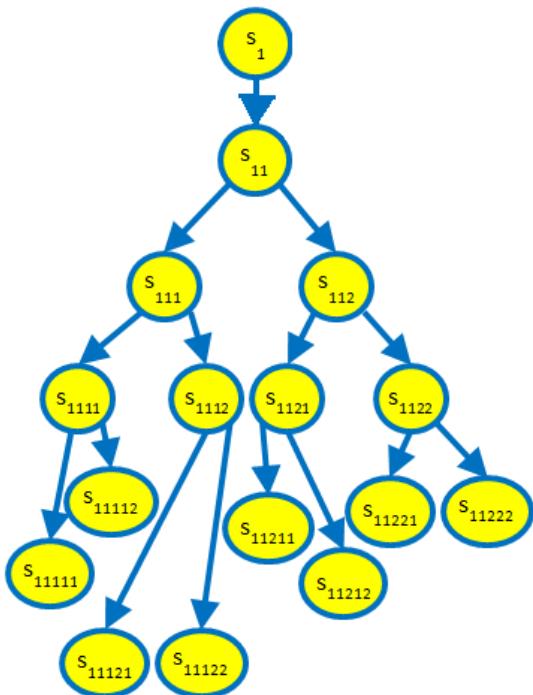
**Question 3**

Incorrect

Mark 0.00 out of 1.00

The following graph shows the static nesting structure of subprograms in a particular program.

The subroutine S1121 is called from the subroutine S11. In the frame of the S1121 subroutine, the static link will be set to the frame of which subroutine (give the index)? If the call is impossible, enter index -1.



Answer:  ✖

The subroutine S1121 cannot be called from the subroutine S11 (only the children, the subroutine recursively, and its ancestors can be called), so the solution is -1

The correct answer is: -1

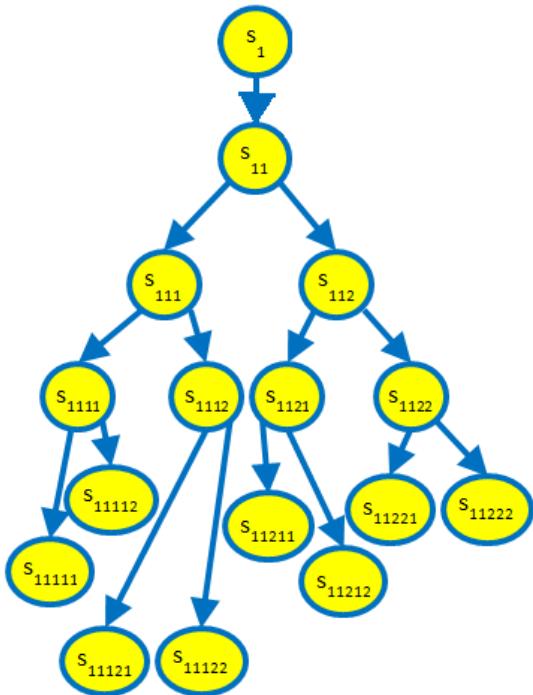
**Question 4**

Incorrect

Mark 0.00 out of 1.00

The following graph shows the static nesting structure of subprograms in a particular program.

The subroutine S11 is called from the subroutine S11211. In the frame of the S11 subroutine, the static link will be set to the frame of which subroutine (give the index)? If the call is impossible, enter index -1.



Answer:  ×

The static link points always to the parent of the called subroutine, so the solution is 1

The correct answer is: 1

**Question 5**

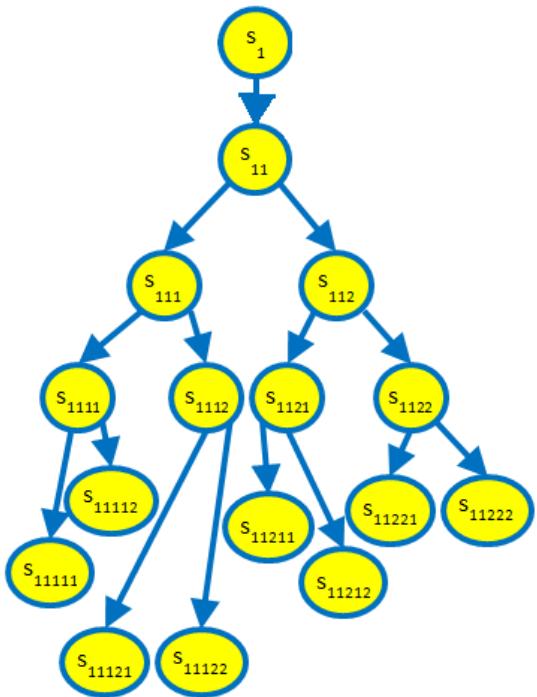
Incorrect

Mark 0.00 out of 1.00

The following graph shows the static nesting structure of subroutines in a particular program.

Can there be in the stack frame of subroutine S11221 a static link to subroutine frame S1122?

answer 0-no, 1-yes



Answer:



The static link points always to the parent of the called subroutine, and the subroutine S1122 is a parent of S11221, so the solution is 1 (yes)

The correct answer is: 1

**Question 6**

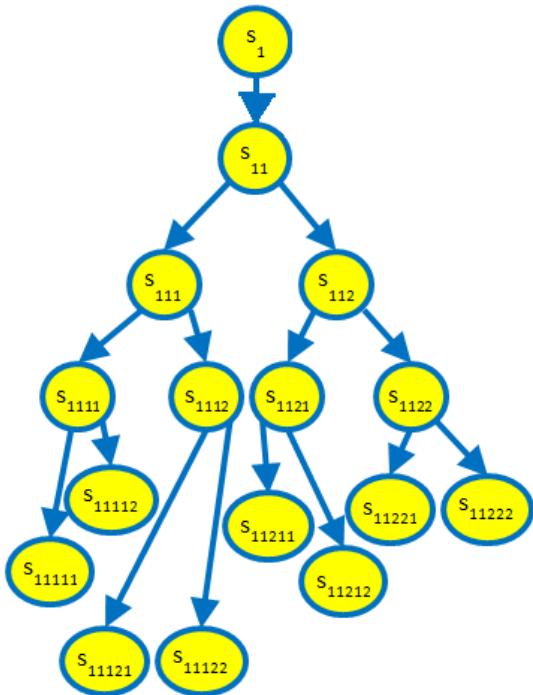
Incorrect

Mark 0.00 out of 1.00

The following graph shows the static nesting structure of subroutines in a particular program.

The subroutine S1122 calls its parent. To which stack frame (of which subroutine) will point the static link in the stack frame of the called subroutine?

Enter the subroutine index, without the letter "S", e.g., for S11122, enter 11122



Answer:



The static link points always to the parent of the called subroutine, and the parent of the subroutine S112 is the subroutine S11, so the solution is 11

The correct answer is: 11

**Question 7**

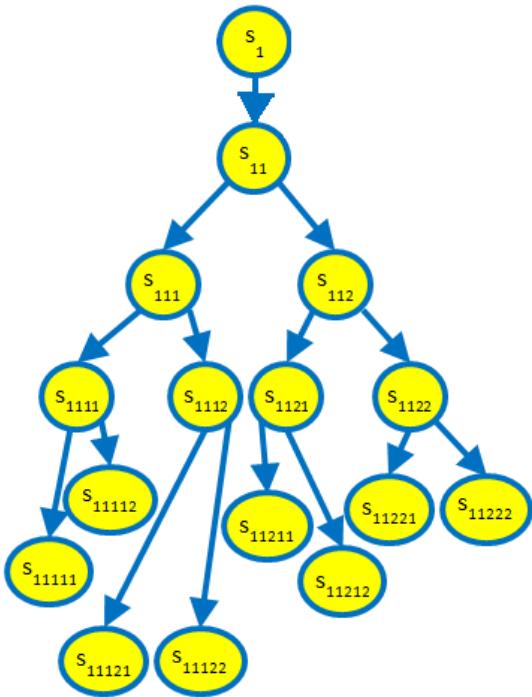
Correct

Mark 1.00 out of 1.00

The following graph shows the static nesting structure of subroutines in a particular program.

The subroutine S1121 makes a recursive call. To which stack frame (of which subroutine) will point the static link in the stack frame of the recursively called subroutine?

Enter the subroutine index, without the letter "S", e.g., for S11122, enter 11122



Answer:



The correct answer is: 112

<b>Started on</b>	Tuesday, 6 May 2025, 10:12 AM
<b>State</b>	Finished
<b>Completed on</b>	Tuesday, 6 May 2025, 10:28 AM
<b>Time taken</b>	16 mins 3 secs
<b>Marks</b>	4.00/4.00
<b>Grade</b>	0.01 out of 0.01 (100%)

**Question 1**

Correct

Mark 1.00 out of 1.00

What is the average time in the system for tasks in the batch incoming in this order, using FCFS algorithm?

task	1	2
processing time	3.4	5.3

Answer:  ✓

The first task finishes at time 3.4. The second task finishes at time  $3.4+5.3=8.7$ .

Average =  $(3.4+8.7)/2=6.05$

The correct answer is: 6,05

**Question 2**

Correct

Mark 1.00 out of 1.00

What is the average time in the system for tasks in the batch incoming in this order, using FCFS algorithm?

We have 2 processors in the system.

task	1	2	3
processing time	3.4	5.3	2.3

Answer: 4.8



For processor 1, the first task is chosen, and it finishes at time 3.4. For processor 2, the second task is chosen and it finishes at time 5.3.

When task 1 finishes, task 3 is chosen for processor 1 and it finishes at time  $3.4+2.3=5.7$ .

$$\text{Average} = (3.4+5.3+5.7)/3=4.8$$

The correct answer is: 4,8

**Question 3**

Correct

Mark 1.00 out of 1.00

What is the average time in the system for tasks in the batch incoming in this order, using SJF algorithm?

task	1	2
processing time	5.3	3.4

Answer: 6.05



The second task is shorter, so it is chosen first, and it finishes at time 3.4. The first task executes after the second and it finishes at time  $5.3+3.4=8.7$ .

$$\text{Average} = (3.4+8.7)/2=6.05$$

The correct answer is: 6,05

**Question 4**

Correct

Mark 1.00 out of 1.00

What is the average time in the system for tasks in the batch incoming in this order, using SJF algorithm?

We have 2 processors in the system.

task	1	2	3
processing time	3.4	5.3	2.3

Answer:

4.43



For processor 1, the third task is chosen because it is the shortest one, and it finishes at time 2.3. For processor 2, the first task is chosen because it is the second shortest, and it finishes at time 3.4.

When task 3 finishes, task 2 is chosen for processor 1 and it finishes at time  $2.3+5.3=7.6$ .

Average =  $(2.3+3.4+7.6)/3=4.43$

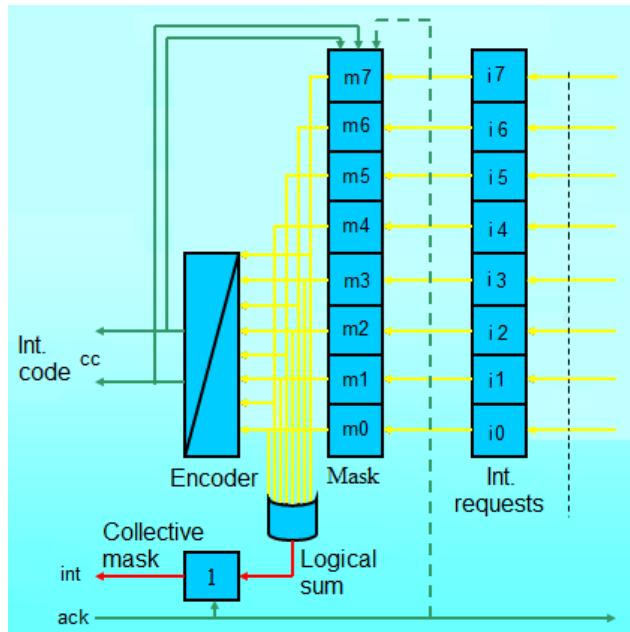
The correct answer is: 4.43

<b>Started on</b>	Tuesday, 6 May 2025, 10:15 AM
<b>State</b>	Finished
<b>Completed on</b>	Tuesday, 6 May 2025, 10:24 AM
<b>Time taken</b>	9 mins 33 secs
<b>Marks</b>	1.00/4.00
<b>Grade</b>	0.00 out of 0.01 (25%)

**Question 1**

Correct

Mark 1.00 out of 1.00



In the given interrupt controller structure, the interrupt mask is 1111100 (from m7 to m0), and interrupts 01011010 (from i7 to i0) are reported.

The interrupt with index 7 has the highest priority.

What will be the value of the interrupt code cc sent to the processor (provide a decimal value)?

If no interrupt is reported, enter -1

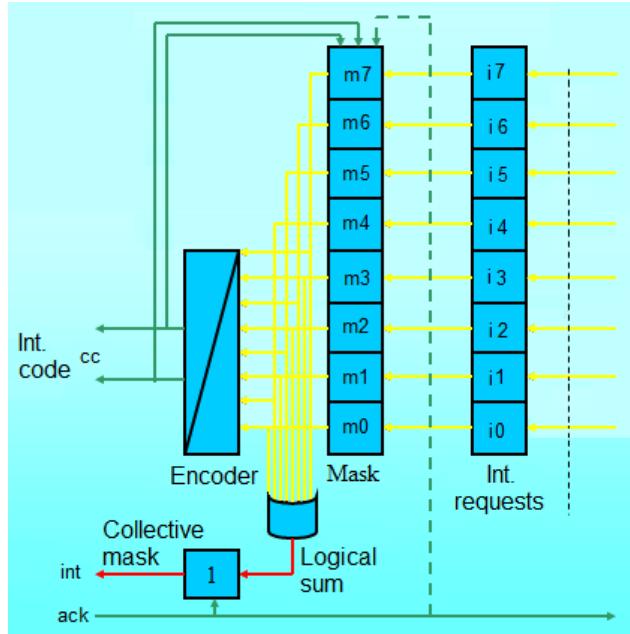
Answer:  ✓

The correct answer is: 6

**Question 2**

Incorrect

Mark 0.00 out of 1.00



In the given interrupt controller structure, the interrupt mask is 11100000 (from m7 to m0). Enter the interrupt number from 0 to 7, without the prefix "i", that caused this mask form.

The interrupt with index 7 has the highest priority.

If no interrupt could cause this mask form, enter -1.

Answer:

5

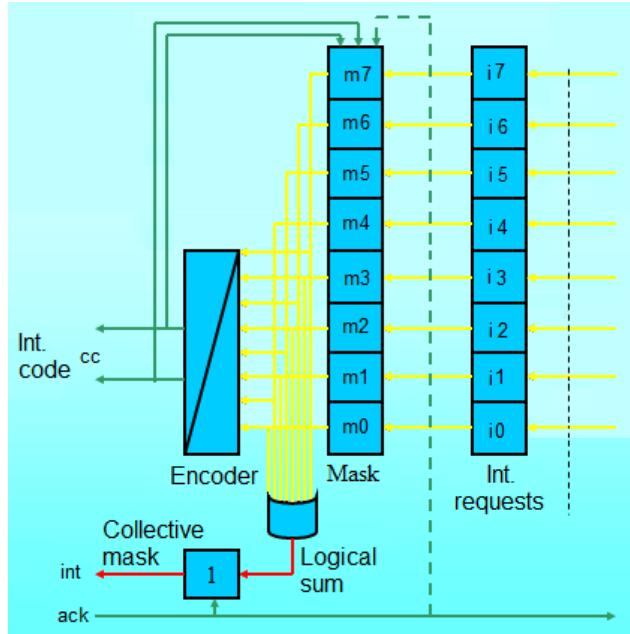


The correct answer is: 4

**Question 3**

Incorrect

Mark 0.00 out of 1.00



In the given interrupt controller structure, the interrupt mask is 11111000 (from  $m_7$  to  $m_0$ ), and interrupts 00101100 (from  $i_7$  to  $i_0$ ) are reported.

The interrupt with index 7 has the highest priority.

What will be the new value of the interrupt mask? Provide the bits  $m_7m_6m_5m_4m_3m_2m_1m_0$ , for example: 01010101

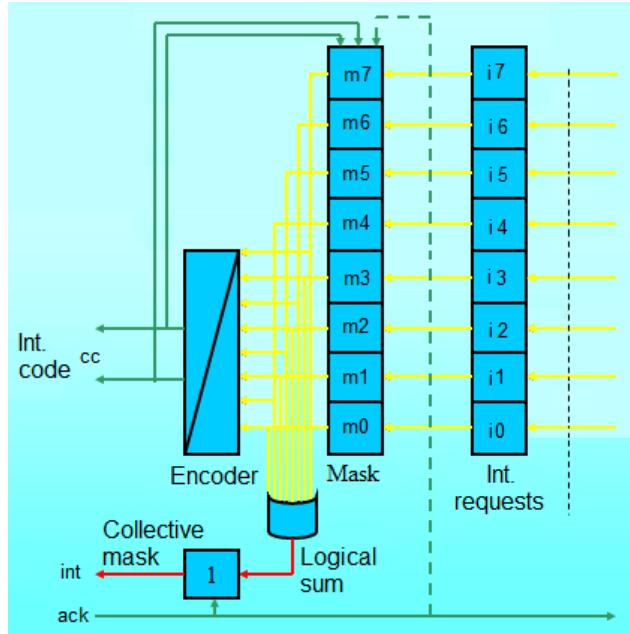
Answer:  ✖

The correct answer is: 11000000

**Question 4**

Incorrect

Mark 0.00 out of 1.00



In the given interrupt controller structure, the interrupt number cc reported to the processor is equal to 5. What will be the form of the interrupt mask (from  $m_7$  to  $m_0$ ) after the processor confirms the reception of this interrupt?

The interrupt with index 7 has the highest priority.

Enter the mask in the form  $m_7m_6m_5m_4m_3m_2m_1m_0$ , for example: 01010101

If this is not possible, enter -1.

Answer:  ×

The correct answer is: 11000000

<b>Started on</b>	Tuesday, 6 May 2025, 10:36 AM
<b>State</b>	Finished
<b>Completed on</b>	Tuesday, 6 May 2025, 10:53 AM
<b>Time taken</b>	17 mins 3 secs
<b>Marks</b>	6.00/22.00
<b>Grade</b>	0.00 out of 0.01 (27.27%)

**Question 1**

Correct

Mark 1.00 out of 1.00

Call parameters
Static link
Result
Trace
Dynamic link
Local variables and work fields

The stack frame is shown above. If the result is an automatic dynamic variable pointed to by the address, what memory area does the result field point to?  ✓

Twoja odpowiedź jest poprawna.

The correct answer is:

Call parameters
Static link
Result
Trace
Dynamic link
Local variables and work fields

The stack frame is shown above. If the result is an automatic dynamic variable pointed to by the address, what memory area does the result field point to? [stack]

**Question 2**

Correct

Mark 1.00 out of 1.00

Call parameters
Static link
Result
Trace
Dynamic link
Local variables and work fields

The stack frame is shown above. If the result is a dynamically managed variable pointed to by address, what memory area does the result field point to?

heap ✓

Twoja odpowiedź jest poprawna.

The correct answer is:

Call parameters
Static link
Result
Trace
Dynamic link
Local variables and work fields

The stack frame is shown above. If the result is a dynamically managed variable pointed to by address, what memory area does the result field point to? [heap]

**Question 3**

Correct

Mark 1.00 out of 1.00

Call parameters
Static link
Result
Trace
Dynamic link
Local variables and work fields

The stack frame is shown above. If the result is a dynamically allocated variable pointed to by address, what memory area does the result field point to?

heap ✓

Twoja odpowiedź jest poprawna.

The correct answer is:

Call parameters
Static link
Result
Trace
Dynamic link
Local variables and work fields

The stack frame is shown above. If the result is a dynamically allocated variable pointed to by address, what memory area does the result field point to? [heap]

**Question 4**

Correct

Mark 1.00 out of 1.00

Call parameters
Static link
Result
Trace
Dynamic link
Local variables and work fields

The stack frame is shown above. If the result is a global variable, pointed to by address, what area of memory does the result field point to?

static data



Twoja odpowiedź jest poprawna.

The correct answer is:

Call parameters
Static link
Result
Trace
Dynamic link
Local variables and work fields

The stack frame is shown above. If the result is a global variable, pointed to by address, what area of memory does the result field point to?

[static data]

**Question 5**

Correct

Mark 1.00 out of 1.00

Call parameters
Static link
Result
Trace
Dynamic link
Local variables and work fields

The stack frame is shown above. What memory area does the trace point to?



Twoja odpowiedź jest poprawna.

The correct answer is:

Call parameters
Static link
Result
Trace
Dynamic link
Local variables and work fields

The stack frame is shown above. What memory area does the trace point to? [code]

**Question 6**

Incorrect

Mark 0.00 out of 1.00

The organization of memory and processor is word-base (int also takes one 16-bit word)

variable a has the value #a0c0

top of the stack (full descending) #c100

stack frame before calling subroutine A #c105

address of subroutine A #1001

Calling rules: C convention, no static link, function result passed in registers. The stack is shown after subroutine A is called, at label point C. Subroutine A is called A(a,a,a); from address #1050.

Regardless of the programming language, subroutine A has the form:

```
A(int x,y,z);
```

```
{
```

```
    int q = x+0x20;
```

```
C: ...
```

```
}
```

Specify, in hexadecimal, what value the cell with the address #c0ff will contain.

Address	content	
#c100	????	
#c0ff		
#c0fe	#a0c0	
#c0fd	#a0c0	
#c0fc	#1051	
#c0fb	#c105	
#c0fa	#a0e0	
#c0f9	????	
#c0f8	????	

Answer: a0e0



The correct answer is: #a0c0

**Question 7**

Incorrect

Mark 0.00 out of 1.00

The organization of memory and processor is word-base (int also takes one 16-bit word)

variable a has the value #a0c0

top of the stack (full descending) #c100

stack frame before calling subroutine A #c105

address of subroutine A #1001

Calling rules: C convention, no static link, function result passed in registers. The stack is shown after subroutine A is called, at label point C. Subroutine A is called A(a,a,a); from address #1050.

Regardless of the programming language, subroutine A has the form:

```
A(int x,y,z);
```

```
{
```

```
    int q = x+0x20;
```

```
C: ...
```

```
}
```

Specify, in hexadecimal, what value the cell with the address #c0fe will contain.

Address	content	
#c100	????	
#c0ff	#a0c0	
#c0fe		
#c0fd	#a0c0	
#c0fc	#1051	
#c0fb	#c105	
#c0fa	#a0e0	
#c0f9	????	
#c0f8	????	

Answer: a0c0



The correct answer is: #a0c0

**Question 8**

Correct

Mark 1.00 out of 1.00

The organization of memory and processor is word-base (int also takes one 16-bit word)

variable a has the value #a0c0

top of the stack (full descending) #c100

stack frame before calling subroutine A #c105

address of subroutine A #1001

Calling rules: C convention, no static link, function result passed in registers. The stack is shown after subroutine A is called, at label point C. Subroutine A is called A(a,a,a); from address #1050.

Regardless of the programming language, subroutine A has the form:

```
A(int x,y,z);
```

```
{
```

```
    int q = x+0x20;
```

```
C: ...
```

```
}
```

Specify, in hexadecimal, what value the cell with the address #c0fd will contain.

Address	content	
#c100	????	
#c0ff	#a0c0	
#c0fe	#a0c0	
#c0fd		
#c0fc	#1051	
#c0fb	#c105	
#c0fa	#a0e0	
#c0f9	????	
#c0f8	????	

Answer: #a0c0 ✓

The correct answer is: #a0c0

**Question 9**

Incorrect

Mark 0.00 out of 1.00

The organization of memory and processor is word-base (int also takes one 16-bit word)

variable a has the value #a0c0

top of the stack (full descending) #c100

stack frame before calling subroutine A #c105

address of subroutine A #1001

Calling rules: C convention, no static link, function result passed in registers. The stack is shown after subroutine A is called, at label point C. Subroutine A is called A(a,a,a); from address #1050.

Regardless of the programming language, subroutine A has the form:

```
A(int x,y,z);
```

```
{
```

```
    int q = x+0x20;
```

```
    C: ...
```

```
}
```

Specify, in hexadecimal, what value the cell with the address #c0fc will contain.

Address	content	
#c100	????	
#c0ff	#a0c0	
#c0fe	#a0c0	
#c0fd	#a0c0	
#c0fc		
#c0fb	#c105	
#c0fa	#a0e0	
#c0f9	????	
#c0f8	????	

Answer: 1051



The correct answer is: #1051

**Question 10**

Incorrect

Mark 0.00 out of 1.00

The organization of memory and processor is word-base (int also takes one 16-bit word)

variable a has the value #a0c0

top of the stack (full descending) #c100

stack frame before calling subroutine A #c105

address of subroutine A #1001

Calling rules: C convention, no static link, function result passed in registers. The stack is shown after subroutine A is called, at label point C. Subroutine A is called A(a,a,a); from address #1050.

Regardless of the programming language, subroutine A has the form:

```
A(int x,y,z);
```

```
{
```

```
    int q = x+0x20;
```

```
C: ...
```

```
}
```

Specify, in hexadecimal, what value the cell with the address #c0fb will contain.

Address	content	
#c100	????	
#c0ff	#a0c0	
#c0fe	#a0c0	
#c0fd	#a0c0	
#c0fc	#1051	
#c0fb		
#c0fa	#a0e0	
#c0f9	????	
#c0f8	????	

Answer:  ×

The correct answer is: #c105

**Question 11**

Incorrect

Mark 0.00 out of 1.00

The organization of memory and processor is word-base (int also takes one 16-bit word)

variable a has the value #a0c0

top of the stack (full descending) #c100

stack frame before calling subroutine A #c105

address of subroutine A #1001

Calling rules: C convention, no static link, function result passed in registers. The stack is shown after subroutine A is called, at label point C. Subroutine A is called A(a,a,a); from address #1050.

Regardless of the programming language, subroutine A has the form:

```
A(int x,y,z);
```

```
{
```

```
    int q = x+0x20;
```

```
C: ...
```

```
}
```

Specify, in hexadecimal, what value the cell with the address #c0fa will contain.

Address	content	
#c100	????	
#c0ff	#a0c0	
#c0fe	#a0c0	
#c0fd	#a0c0	
#c0fc	#1051	
#c0fb	#c105	
#c0fa		
#c0f9	????	
#c0f8	????	

Answer: a0e0



The correct answer is: #a0e0

**Question 12**

Incorrect

Mark 0.00 out of 1.00

The organization of memory and processor is word-based (int also takes 1 word)

variable a has the value #c0a0

top of the stack (full descending) #c100

address of subroutine A #1010

Calling rules: C convention, no static link, function result passed in registers. The contents of the stack after preparing the subroutine call parameters A. Subprogram A is called A(a,a,a); from address #10a0.

Regardless of the programming language, the subroutine header A has the form:

A(int x,y,z);

Specify, in hexadecimal, what value the cell with the address #c0ff will contain.

Adres	zawartość	
#c100	????	
#c0ff		
#c0fe	#a0a0	
#c0fd	#c0a0	
#c0fc	????	
#c0fb	????	

Answer:  ×

The correct answer is: #a5a0

**Question 13**

Incorrect

Mark 0.00 out of 1.00

The organization of memory and processor is word-based (int also takes 1 word)

variable a has the value #c0a0

top of the stack (full descending) #c100

address of subroutine A #1010

Calling rules: C convention, no static link, function result passed in registers. The contents of the stack after preparing the subroutine call parameters A. Subprogram A is called A(a,a,a); from address #10a0.

Regardless of the programming language, the subroutine header A has the form:

A(int x,y,z);

Specify, in hexadecimal, what value the cell with the address #c0fe will contain.

Adres	zawartość	
#c100	????	
#c0ff	#a5a0	
#c0fe		
#c0fd	#c0a0	
#c0fc	????	
#c0fb	????	

Answer:  ×

The correct answer is: #a0a0

**Question 14**

Incorrect

Mark 0.00 out of 1.00

The organization of memory and processor is word-based (int also takes 1 word)

variable a has the value #c0a0

top of the stack (full descending) #c100

address of subroutine A #1010

Calling rules: C convention, no static link, function result passed in registers. The contents of the stack after preparing the subroutine call parameters A. Subprogram A is called A(a,a,a); from address #10a0.

Regardless of the programming language, the subroutine header A has the form:

A(int x,y,z);

Specify, in hexadecimal, what value the cell with the address #c0fd will contain.

Adres	zawartość	
#c100	????	
#c0ff	#a5a0	
#c0fe	#a0a0	
#c0fd		
#c0fc	????	
#c0fb	????	

Answer:  ×

The correct answer is: #c0a0

**Question 15**

Incorrect

Mark 0.00 out of 1.00

The organization of memory and processor is word-based (int also takes 1 word)

Variable a has a value #a0a0

Stack top (full descending) #c100

stack frame before calling the subroutine B #c01d

subroutine B address #10d1

Rules for calling: Language C convention, without a static link, the result of the function returned in the registers. The content of the stack is shown after calling the subroutine B, and then recursive by itself, at the label C. Subroutine B is called for the first time B(a); somewhere in the program from the #1cff address. The label C has #1d10 address

Regardless of the programming language, the subroutine B is in the form

B (int i);

{

    int j=i-2;

    C: B (j-1);

}

What is the value, in hexadecimal, of the cell at address #c0ff?

Address	content	
#c100	????	
#c0ff		
#c0fe	#1d00	
#c0fd	#c01d	
#c0fc	#a09e	
#c0fb	#a09d	
#c0fa	#1d11	
#c0f9	#c0fd	
#c0f8	#a09b	
#c0f7	????	

Answer:  ×

The correct answer is: #a0a0

**Question 16**

Incorrect

Mark 0.00 out of 1.00

The organization of memory and processor is word-based (int also takes 1 word)

Variable a has a value #a0a0

Stack top (full descending) #c100

stack frame before calling the subroutine B #c01d

subroutine B address #1d10

Rules for calling: Language C convention, without a static link, the result of the function returned in the registers. The content of the stack is shown after calling the subroutine B, and then recursive by itself, at the label C. Subroutine B is called for the first time B(a); somewhere in the program from the #1cff address. The label C has #1d10 address

Regardless of the programming language, the subroutine B is in the form

B (int i);

{

    int j=i-2

    C: B (j-2);

}

What is the value, in hexadecimal, of the cell at address #c0fe?

Address	content	
#c100	????	
#c0ff	#a0a0	
#c0fe		
#c0fd	#c01d	
#c0fc	#a09e	
#c0fb	#a09c	
#c0fa	#1d11	
#c0f9	#c0fd	
#c0f8	#a09a	
#c0f7	????	

Answer:  ×

The correct answer is: #1d00

**Question 17**

Incorrect

Mark 0.00 out of 1.00

The organization of memory and processor is word-based (int also takes 1 word)

Variable a has a value #a0a0

Stack top (full descending) #c100

stack frame before calling the subroutine B #c01d

subroutine B address #10d1

Rules for calling: Language C convention, without a static link, the result of the function returned in the registers. The content of the stack is shown after calling the subroutine B, and then recursive by itself, at the label C. Subroutine B is called for the first time B(a); somewhere in the program from the #1cff address. The label C has #1d10 address

Regardless of the programming language, the subroutine B is in the form

B (int i);

{

    int j=i-1;

    C: B (j-2);

}

What is the value, in hexadecimal, of the cell at address #c0fd?

Address	content	
#c100	????	
#c0ff	#a0a0	
#c0fe	#1d00	
#c0fd		
#c0fc	#a09f	
#c0fb	#a09d	
#c0fa	#1d11	
#c0f9	#c0fd	
#c0f8	#a09c	
#c0f7	????	

Answer:  ×

The correct answer is: #c01d

**Question 18**

Incorrect

Mark 0.00 out of 1.00

The organization of memory and processor is word-based (int also takes 1 word)

Variable a has a value #a0a0

Stack top (full descending) #c100

stack frame before calling the subroutine B #c01d

subroutine B address #10d1

Rules for calling: Language C convention, without a static link, the result of the function returned in the registers. The content of the stack is shown after calling the subroutine B, and then recursive by itself, at the label C. Subroutine B is called for the first time B(a); somewhere in the program from the #1cff address. The label C has #1d10 address

Regardless of the programming language, the subroutine B is in the form

B (int i);

{

    int j=i-2;

    C: B (j-2);

}

What is the value, in hexadecimal, of the cell at address #c0fc?

Address	content	
#c100	????	
#c0ff	#a0a0	
#c0fe	#1d00	
#c0fd	#c01d	
#c0fc		
#c0fb	#a09c	
#c0fa	#1d11	
#c0f9	#c0fd	
#c0f8	#a09a	
#c0f7	????	

Answer: a09f



The correct answer is: #a09e

**Question 19**

Incorrect

Mark 0.00 out of 1.00

The organization of memory and processor is word-based (int also takes 1 word)

Variable a has a value #a0a0

Stack top (full descending) #c100

stack frame before calling the subroutine B #c01d

subroutine B address #10d1

Rules for calling: Language C convention, without a static link, the result of the function returned in the registers. The content of the stack is shown after calling the subroutine B, and then recursive by itself, at the label C. Subroutine B is called for the first time B(a); somewhere in the program from the #1cff address. The label C has #1d10 address

Regardless of the programming language, the subroutine B is in the form

B (int i);

{

    int j=i-1;

    C: B (j-2);

}

What is the value, in hexadecimal, of the cell at address #c0fb?

Address	content	
#c100	????	
#c0ff	#a0a0	
#c0fe	#1d00	
#c0fd	#c01d	
#c0fc	#a09f	
#c0fb		
#c0fa	#1d11	
#c0f9	#c0fd	
#c0f8	#a09c	
#c0f7	????	

Answer:  ×

The correct answer is: #a09d

**Question 20**

Incorrect

Mark 0.00 out of 1.00

The organization of memory and processor is word-based (int also takes 1 word)

Variable a has a value #a0a0

Stack top (full descending) #c100

stack frame before calling the subroutine B #c01d

subroutine B address #10d1

Rules for calling: Language C convention, without a static link, the result of the function returned in the registers. The content of the stack is shown after calling the subroutine B, and then recursive by itself, at the label C. Subroutine B is called for the first time B(a); somewhere in the program from the #1cff address. The label C has #1d10 address

Regardless of the programming language, the subroutine B is in the form

B (int i);

{

    int j=i-2;

    C: B (j);

}

What is the value, in hexadecimal, of the cell at address #c0fa?

Address	content	
#c100	????	
#c0ff	#a0a0	
#c0fe	#1d00	
#c0fd	#c01d	
#c0fc	#a09e	
#c0fb	#a09e	
#c0fa		
#c0f9	#c0fd	
#c0f8	#a09c	
#c0f7	????	

Answer:  ×

The correct answer is: #1d11

**Question 21**

Incorrect

Mark 0.00 out of 1.00

The organization of memory and processor is word-based (int also takes 1 word)

Variable a has a value #a0a0

Stack top (full descending) #c100

stack frame before calling the subroutine B #c01d

subroutine B address #10d1

Rules for calling: Language C convention, without a static link, the result of the function returned in the registers. The content of the stack is shown after calling the subroutine B, and then recursive by itself, at the label C. Subroutine B is called for the first time B(a); somewhere in the program from the #1cff address. The label C has #1d10 address

Regardless of the programming language, the subroutine B is in the form

B (int i);

{

    int j=i-1;

    C: B (j-1);

}

What is the value, in hexadecimal, of the cell at address #c0f9?

Address	content	
#c100	????	
#c0ff	#a0a0	
#c0fe	#1d00	
#c0fd	#c01d	
#c0fc	#a09f	
#c0fb	#a09e	
#c0fa	#1d11	
#c0f9		
#c0f8	#a09d	
#c0f7	????	

Answer:  ×

The correct answer is: #c0fd

**Question 22**

Incorrect

Mark 0.00 out of 1.00

The organization of memory and processor is word-based (int also takes 1 word)

Variable a has a value #a0a0

Stack top (full descending) #c100

stack frame before calling the subroutine B #c01d

subroutine B address #10d1

Rules for calling: Language C convention, without a static link, the result of the function returned in the registers. The content of the stack is shown after calling the subroutine B, and then recursive by itself, at the label C. Subroutine B is called for the first time B(a); somewhere in the program from the #1cff address. The label C has #1d10 address

Regardless of the programming language, the subroutine B is in the form

B (int i);

{

    int j=i-3;

    C: B (j-2);

}

What is the value, in hexadecimal, of the cell at address #c0f8?

Address	content	
#c100	????	
#c0ff	#a0a0	
#c0fe	#1d00	
#c0fd	#c01d	
#c0fc	#a09d	
#c0fb	#a09b	
#c0fa	#1d11	
#c0f9	#c0fd	
#c0f8		
#c0f7	????	

Answer:  ×

The correct answer is: #a098

**1.**The system stack must provide space for:

- Processor registers in as many copies as there are interrupt lines +1

**2.**Twice consecutive execution in one process of operation P on a raised binary semaphore:

- Causes the semaphore to get down
- If a semaphore guards a critical region, it leads to a deadlock

**3.**In UNIX, access rights are attributes:

- An entry in the I-node table

**4.**The kernel (microkernel) is responsible for:

- interrupt handling (at the elementary level, then they are passed on to other layers)
- synchronization of processes and devices with processes
- task control

**5.**In multi-level interrupts (vectored interrupts) the jump is performed:

- according to the table indexed by the interrupt number

**6.**In UNIX, the disk contains the following areas:

- Files data
- I-node table
- SuperBlock

**7.**What is this technique where the operating system gathers programs and data together before processing?

- Batch processing

**8.**The page fault interrupt is used to:

- Downloads to the memory of the requested page

**9.**Scheduling algorithms can be:

- Indulgent
- Preemptive

**10.** The resources of the computer system are:

- Primary memory
- Peripheral devices
- Processor time

**11.** When is the scheduler called?

- at the end of the execution of each kernel procedure

**12.** A memory management technique in which the system divides memory into equal-sized portions to easily manage relocation is called:

- paging

**13.** What does the file system layer do?

- Manages files
- Manages directories
- Manages free storage space
- Tracks the status of information

**14.** Indulgent scheduling is the best mechanism for:

- real-time system

**15.** What does the kernel do when there is no task (process) to run?

- Starts the idle task

**16.** Discontinuous allocation is the result of:

- segmentation
- paging

**17.** Paging is in thrashing if:

- the system spends more time paging than execution
- 18.** The return from interrupt instruction:
- restores the conditions register
  - restores the program counter
- 19.** Dynamic relocation requires the use of:
- Base register (DATUM)
- 20.** A program compiled for execution in paged memory can be executed in regular memory.  
False
- 21.** Page thrashing is a phenomenon involving:
- frequent downloading of pages that have just been swapped out from memory
  - Frequent loading of pages that have just been ejected from memory
- 22.** Semaphores are used to solve the problem:
- Mutual exclusion
- 23.** Dirty frame is:
- modified
- 24.** The common allocation queue to fixed blocks of memory of equal size causes:
- Internal fragmentation
- 25.** Which scheduler needs to make a decision the fastest?
- short-term
- 26.** In operating system:
- Every exception must be handled
- 27.** Static relocation is performed by:
- compiler
  - linker
  - Loader
- 28.** Operation V on a raised binary semaphore:
- It does not change the value of the semaphore
- 29.** Fragmentation is implied by:
- Internal by paging
  - Internal by partitioning into quantized blocks
  - External by freeing blocks in a deallocation order not reverse to allocation
  - External by resizing allocated blocks
- 30.** A process can appear in the pool of scheduling processes as a result of:
- Performing V operation on the semaphore
  - Completing an I/O operation
  - Starting a new process
- 31.** External fragmentation can be avoided by:
- Allocation of fixed size static memory blocks
  - Freeing memory blocks in the reverse order to allocation
- 32.** The Test-And-Set or Compare-And-Swap instruction has the following characteristics:
- Requires active waiting from tasks
  - It is possible to use only on computers with common memory
  - It is possible to deadlock with TAS/CAS operations on multiple variables
- 33.** Address translation is handled by a unit called (give the abbreviation):
- MMU
- 34.** Dynamic relocation:
- Requires hardware support in the form of a DATUM register

- Allows for temporal elimination of external fragmentation

**35.** Opening a file in UNIX writes the following entries in the operating system's data structures:

- Inserting a new entry into the Table of Active I-nodes or increasing the counter in an existing entry
- Inserting a new item into the Table of Open Files of the Process

**36.** What type of code can multiple processes execute simultaneously?

- reentrant

**37.** Address translation aims to:

- Converting a virtual address to a physical one

**38.** The optimal scheduling algorithm in terms of minimizing the average time in the system of a given task is:

- SJF

**39.** Inter-process communication can be organized using:

- messages
- shared directly addressable memory fields
- shared memory fields accessible through system calls

**40.** For concurrency in OS:

- Interrupt handling is necessary

**41.** Which of the following information is stored on task switching?

- I/O status information
- scheduler data
- contents of general purpose registers, program counter, and similar registers available to the program
- Contents of datum, limit and other registers inaccessible to the program

**42.** The conversion of the effective address to the physical one takes place:

- In the memory management unit

**43.** Which of the following statements is true for system level threads?

- Kernel-level threads require their descriptors in the kernel

**44.** Address translation mechanism:

- Concatenates the frame number and offset on the page

**45.** Dynamic relocation is performed by:

- Paging system
- Special registers (DATUM)
- Segment descriptors

**46.** What is included in the context that must be maintained for a synchronous precision interrupt?

- general purpose registers
- program counter
- collective or individual interrupt mask

**47.** System/user threads:

- User-level thread descriptors are stored in the address space of the program
- User-level threads share the same execution context
- System level thread descriptors are stored in the operating system kernel

**48.** How is exception identification performed?

- the specification of hardware interrupts is given over the data bus

**49.** The combination of paging and segmentation consists in:

- the use of a segment table or a pool of segment registers treated as an additional, superior level of paging

- 50.** The behavior of the exchange algorithm opposite to that expected with the measures taken is called:
- anomaly
- 51.** The hardware resources of a computer system are:
- Processor time
  - Primary memory
  - Peripheral devices
- 52.** How does the operating system call the task completion subroutine?
1. → builds the frame of the terminating subroutine on the task stack
  2. → sets the trace in the terminating subroutine to the current position
  3. → builds an interrupt vector on the system stack pointing to the terminating subroutine code
  4. → recreates the context programmatically and executes the IRET instruction
- 53.** What mechanism is part of time-sharing systems?
- short-term scheduler
  - low-level scheduler
- 54.** On UNIX, the number of files is directly limited by:
- I-node table size
  - The size of the space allocated for files
- 55.** What are the functions of the kernel?
- Interrupt handling
- 56.** What type of code can be executed simultaneously on multiple processors?
- reentrant
- 57.** MMU uses index tables to:
- generating a physical address
  - generate a physical address
- 58.** To end the interrupt service, use the following instruction:
- Special return instruction
- 59.** Physical address:
- points to a location in the address space of primary memory
- 60.** Threads in operating system:
- They share context except registers and stack
- 61.** The page fault exception is specific in that:
- is reported in the "middle" of an instruction execution
  - execution of the instruction may require decrementing the program counter
  - continuation of the instruction execution may require the saving of internal processor registers storing intermediate values
- 62.** Virtual memory consists of:
- Primary memory and storage memory
  - primary and mass memory
- 63.** The scheduling goal, which is to occupy processors as efficiently as possible, is:
- utilization
- 64.** The use of timer interrupts is necessary:
- In multiuser systems
  - At the suspended state is a process that:
  - Waits for an I/O operation to complete
- 65.** Which of the following memory allocation schemes causes external fragmentation?

- Segmentation
  - Sweeping
  - Multiple contiguous fixed partitions of various sizes
66. Which of the following interrupts a running process?
- Hardware interrupt
  - Timer interrupts
  - Power fail interrupt
67. Conditional variables in a monitor:
- They are used to suspend processes that cannot run because the conditions for their continuation are not met
68. In a FAT-based disk system (without sharing allocation units by files), the number of files is directly limited by:
- FAT table size
  - The size of the disk space
69. In a FAT-based disk system, file size is directly limited by:
- The size of the disk space
  - The number of bits of the field describing the size of the file
70. The scheduler decisions take the form:
- change from ready to active state
71. Interrupt vector is saved in a case of:
- accepting a hardware interrupt
  - accepting a non-maskable interrupt
  - jump with trace
72. Allocation unit for file storage:
- must be constant across the disk partition
  - may vary between partitions
73. Allocation unit for storing files:
- must be constant across the disk partition
  - may vary between partitions
74. FIRST-FIT algorithm:
- Causes external fragmentation
75. Processor access scheduling decisions may be made under which of the following circumstances?
- When a task goes from the active state to the waiting state
  - When a task transitions from the active state to the ready state
  - When a task goes from the waiting state to the ready state
  - When a task terminates
76. The following situations cause the exceptions (processor internal interrupts) of the "error" type:
- a reference to memory that is not in the address space
  - memory reference beyond limit register value
  - an attempt to write to the page for which the "read only" bit is set
77. Multiprogram systems:
- It holds more than one program in primary memory at the same time
78. The direct resume rule means that:
- The resuming process loses the critical region
  - The resuming process applies for the critical region just like other processes on monitor input

- The resuming process applies for the critical region just like other processes waiting to enter the critical region

**79.** What is true for simultaneous execution in the same context?

- Threads minimize context switch time
- The use of threads ensures concurrency within the process
- A multiprocessor kernel can be concurrent

**80.** The following situations trigger "error" exceptions:

- attempting to execute an illegal instruction
- attempting to execute in user mode an instruction that is only legal in system mode
- a reference to memory that is not in the program address space
- memory reference beyond limit register value
- an attempt to execute an instruction from the area of the page for which the "no code" bit was set

**81.** When an exception is raised in user mode, the operating system switches to the kernel system stack, and what happens when an exception is raised in system mode?

- nothing special, it builds the context on the kernel system stack

**82.** The number of condition variables is by definition in the monitor:

- as many as there are different conditions for the continuation of processes

**83.** What mechanism is used to desynchronize processes with different relative speeds?

- buffer

**84.** Is IOW bit:

- Protection bit

**85.** Sequence of actions when starting a new task:

1. filling in the descriptor in the kernel
2. memory allocation if this is the first task of the program
3. initialize the stack, fill the first frame
4. instruction to transfer control to the task

**86.** A multiprogram system is one that, in principle:

- It allows for storing many programs in primary memory
- It allows for storing many programs in the main memory
- Requires relocation or equivalent mechanism

**87.** A single-program system is one that, in principle:

- Allows for storing only one program in primary memory

**88.** The common allocation queue to fixed blocks of memory of different sizes causes:

- internal fragmentation
- external fragmentation

**89.** If the compiler prepares a program with absolute addresses to be loaded in a fixed address space, it is called:

- Static relocation

**90.** During the interrupt handling:

- other interrupts may or may not be accepted at the discretion of the programmer

**91.** Scheduling aims to optimize:

- processor utilization
- system throughput
- wait time
- reaction time

**92.** The page index table address is stored in:

- page table base register
- 93.** Page Index Table address is kept in:
- page table base register
- 94.** The file system layer plays the following role in the operating system:
- Performs file opening and closing operations
  - It performs directory services in the hierarchy of disk files
  - Controls file access rights
- 95.** The algorithm in which the most recently loaded page is swapped out is called (enter the abbreviation if applicable):
- FIFO
- 96.** The algorithm in which the most recently used page is swapped out is called (enter the abbreviation if applicable):
- LRU
- 97.** In which swapping algorithms is the M bit value used?
- NRU
- 98.** Using Test-And-Set or Compare-And-Swap in synchronization:
- It requires processes to actively wait
  - It can only be applied in systems with shared memory
- 99.** Using the Test-And-Set instruction in synchronization:
- It requires processes to actively wait
- 100.** Memory partitioning into blocks of any size:
- It does not imply fragmentation
- 101.** What can happen when a job leaves the critical section and more than 1 task is waiting for the critical section?
- starvation awaiting a critical section
- 102.** The root directory of the disk should be located:
- in a place designated by the data structure in a fixed location on the disk
- 103.** Which technique was introduced because a single task could occupy both the CPU and I/O devices?
- Interrupts
- 104.** Individual interrupt mask:
- a register whose bits are ANDed (conjunction) with the bits from the interrupt request register
- 105.** Which swapping algorithms use the current time slice number?
- Second chance
  - Working set
- 106.** Paging-two-level index tables mode of operation
- The content of a level 1 table element points to a level 2 table
- 107.** What is a scheduler?
- a kernel routine that selects a task to execute
- 108.** In indulgent scheduling, the process keeps the CPU until:
- waiving
  - termination
- 109.** With indulgent scheduling, once a CPU is allocated to a task, the task keeps it until:
- releasing the processor by the task
  - task termination
- 110.** Two successive executions of operation V in one process on a binary semaphore in down state:
- If the semaphore guards a critical region, it can let two processes enter the critical region

- Raises the semaphore if there are no suspended processes

**111.** The operating system plays the following role in a computer system:

- Create a concurrent environment
- computer system resource management
- creating abstraction (virtualization) of hardware

**112.** What mechanism is used to save and restore the task state?

- Context switch

**113.** What mechanism is used to preserve the states of preempted tasks?

- Context switch

**114.** Internal fragmentation consists in:

- The program does not use all the memory allocated to it

**115.** The following paging exceptions allow for returning to the program after they occur:

- page fault
- interrupt on write (IOW)

**116.** For address translation, the following is used:

- index table
- associative translation buffer

**117.** In UNIX, access rights are specified:

- Individually for each file
- Separately for the user, the group to which the user belongs and for all others
- Separately for write, read and execute/search

**118.** Calling the program with the "exec" operation results in (accurately to the result of the exec operation):

- Loading code and data segments from disk, initializing a new stack segment

**119.** Scheduler function is:

- selecting a task to run

**120.** In the philosophers problem, if there are 4 of them:

- Deadlock is possible
- Starvation is not possible

**121.** The software resources of a computer system are:

- Files
- Buffers
- Semaphores

**122.** Can the exchange algorithm: selecting a frame to empty and loading a new page, be performed in user mode?

- True

**123.** Interrupt mask:

- causes interrupts to be disabled when an interrupt is accepted
- can unblock interrupts when the interrupt handler completes
- can be set and reset by special processor instructions

**124.** Which swapping algorithms use page reference history?

- LRU
- LFU

**125.** The thread is also called:

- Lightweight process

**126.** Round-robin scheduling is the best mechanism for:

- time-sharing system

- 127.** Priority scheduling is the best mechanism for:
- system with many process classes
- 128.** Context switch is:
- writing registers to the task stack and retrieving them from another task stack
- 129.** Separate allocation queues for fixed memory blocks of equal size cause:
- internal fragmentation
  - external fragmentation
- 130.** A multiuser system is one that, in principle:
- Must be concurrent
  - Requires the use of timer interrupts
- 131.** In which swapping algorithms is it necessary to collectively clear the M-bits?
- No algorithm
  - NRU (? w pdf jest inaczej niż w docx)
- 132.** Interrupt request register is:
- a register where interrupt line states are stored
- 133.** The internal state of the file system layer is available for:
- OS kernel
  - Program supervisor layer
- 134.** "Soft" real-time system:
- Guarantees average response time
- 135.** The key in associative memory is:
- Page number
- 136.** The sweeping mechanism consists in:
- Loading segments into primary memory and sending them to disk
- 137.** The interrupt acceptance sequence consists of (in the sequence):
- identification of the interrupt level, saving the interrupt vector, performing a jump with a trace according to the interrupt table
- 138.** Imprecise interrupts can be handled:
- after clearing the pipeline from the instructions
  - after saving the full state of the pipeline
- 139.** Logical address:
- points to a cell in the process address space
  - is converted to a physical address in the address translation mechanism
- 140.** Imprecise interrupts are:
- accepted in any state of the processor, not just between the execution of successive instructions
- 141.** Precise interrupts are:
- accepted only in a stable state between the execution of successive instructions
- 142.** Internal fragmentation can be removed by:
- No response from the others
- 143.** The mechanism for moving programs between primary memory and mass storage is called:
- sweeping
- 144.** Semaphore function is to:
- Synchronize critical resources to prevent a deadlock
- 145.** Between fork and exec operations, the following operations are performed:
- Opening the appropriate input/output files
- 146.** The sweeping criteria include:
- Priority

- Program state
- Analysis of program execution history

**147.** The number of tasks performed on the system in a given time is:

- throughput

**148.** By definition, a deadlock is a situation where:

- any greater than zero number of processes are waiting for conditions that cannot be met

**149.** SJF selects the task:

- with the least CPU requirement

**150.** Which swapping algorithms use the history of page references (when was it last used or in which time slices was it used)?

- second chance
- LRU
- LFU
- working set

**151.** The page reference and modification bits are used to:

- counting references for swapping optimization
- counting references for optimize exchanges

**152.** When the processor is released, the scheduler selects one of the queued processes:

- ready

**153.** The page error (page fault) interrupt is used to:

- download the requested page to the primary memory

**154.** Logical address is:

- effective address

**155.** The logical address is also:

- Effective address

**156.** In what states can a task occur?

- current
- ready
- blocked

**157.** The effective address is at the same time:

- logical address

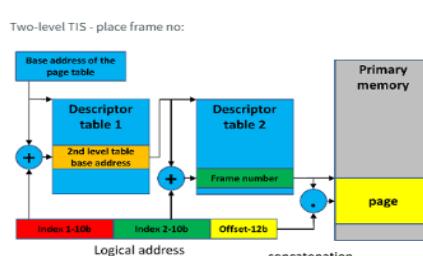
**158.** The effective address is also:

- Logical address

**159.** The content of the last (lowest in the hierarchy) page index table is:

- frame

**160.** Two-level TIS - place frame no:



- in the table of the second level - on the right in the figure

**161.** The environment in which the process is executed includes:

- A set of environment variables

- Process address space

- General purpose registers content

- Open files

**162.** Which of the following applies to user-level threads?

- User-level threads cost no execution time in system mode

**163.** WORST-FIT algorithm:

- Requires a descending sort of the list of free blocks

- It allows for fast determining whether there is a free block of the required size

- It is designed to reduce external fragmentation

- Requires sorting the cut part into the list of free blocks

**164.** The hardware mechanisms necessary for paging are ("frame error" also called "page fault", "frame miss"):

- address translation, page index tables, "frame error" interrupt

**165.** Having two-level page index tables:

- the content of a level I table element points to a level II table

**166.** Which swapping algorithms use information about a reference to pages in the last k periods of time?

- working set

- working set clock

**167.** When a suspended program is moved to auxiliary memory, its process state is called:

- Swept away

**168.** Which of the following facilities or abilities are required to provide mutual exclusion support?

- A task that is performed outside the critical section must not affect the behavior of a task in the critical section.

- The task stays in its critical section only for a finite amount of time

**169.** If a linker prepares a program with absolute addresses to be loaded in a fixed address space, it is called:

- Static relocation

**170.** At the blocked state is a process that:

- waits for an I/O operation to complete

**171.** Collective interrupt mask is:

- a register that blocks or unblocks all interrupts

**172.** Which swapping algorithms can be implemented based on hardware support in the form of a collective reading of reference bits and collective clearing of these bits?

- LRU

- LFU

**173.** In a multitasking environment, the operating system decides which task the CPU gets, when, and for how long. This feature is called:

- Task scheduling

**174.** Is memory protection useless in a non-concurrent system?

- False

**175.** The program supervisor layer in the operating system has the following role:

- Intercepts all program system calls and routes them to the appropriate layers

- Runs programs

- Deals with the management of primary memory (memory allocation to programs)

**176.** A process always transitions from the "user" state to the "system" state as a result of:

- A software interrupt that calls a system function

- Debugger trap
- 177.** At the ready state is a process that:
- Waits for a processor
- 178.** The kernel is \_\_\_\_\_ user-level threads.
- unaware
- 179.** After performing the mount(/dev/hd5,/usr/x/bin/hd5) operation, the file /usr/z/a on the mounted disk should be referenced by:
- /usr/x/bin/hd5/usr/z/a
- 180.** In a concurrent environment, the operating system decides which task the CPU gets, when, and for how long. This feature is called:
- Task scheduling
- 181.** There are three processes in the system:  
C - calculation process (batch process performing complex calculations lasting several hours),  
T - text editor (user edits text document)  
K - compiler (the user compiles the program, e.g. in C++).
- Assign processes to priorities in the operating system from the highest to the lowest priority.
- highest [T]
  - intermediate [K]
  - lowest [C]
- 182.** In which swapping algorithms is it necessary to clear the M bits individually?
- No algorithm
- 183.** In round-robin scheduling, if each task is allotted a certain amount of time to execute, it is called:
- Time slice
- 184.** The program must be specially compiled to run in paged memory.
- false
- 185.** Interrupt vector:
- it is saved automatically when an interrupt is accepted
  - contains minimal information that cannot be saved programmatically
- 186.** Paging - the key in associative memory is:
- Page number
- 187.** Frame protection bits:
- Must be available for writing
- 188.** The multi-level interrupt controller includes:
- Collective interrupt mask
  - Interrupt request register
  - Individual interrupt mask
  - Priority encoder
- 189.** Compaction solves the problem:
- External fragmentation
- 190.** Converting the effective address to physical is performed in:
- memory management unit
- 191.** The microkernel of the operating system performs the following role:
- Synchronizes processes
  - It receives interrupts and routes them to the appropriate drivers and other layers of the system

**192.** Consider the following sequence of address references:

123, 215, 600, 1234, 76, 96.

If the page size is 100, the order of page references is as follows:

- 1,2,6,12,0,0

(simply divide by 100, discard remainders, if 0.87 or sth, it is 0)

**193.** Multiprogramming is a technique in which, as a rule:

- many programs can be stored in primary memory

**194.** What is included in the context that must be saved for a synchronous (inter-instruction) precision interrupt?

- collective of individual interrupt mask
- general purpose registers
- program counter

**195.** General semaphore:

- is to perform only indivisible operations
- is a shared variable
- can be only non-negative

**196.** What is true about system level threads?

- All process threads share the same address space.
- All process threads can share the same set of open files.
- All process threads can share the same set of child processes.

**197.** In the case of hardware interrupt summation ("wire or"):

- the processor can programmatically poll devices about issuing an interrupt
- the bus driver can poll devices about issuing an interrupt

**198.** Multi-threading on a multi-processor machine:

- increases concurrency

**199.** Essential activity in the interrupt handling procedure (i.e., the activity for which the interrupt is issued) consists in:

- unlocking the process waiting for this interrupt

**200.** Which task queue can never be empty?

- running tasks

**201.** The process context includes:

- General purpose registers
- Process descriptor (? – question 79 & 59)
- Code and data

**202.** When starting a program, how is control passed to it from the operating system?

- return from interrupt handler IRET

**203.** Which of the following statements applies to the process?

- A process is defined as a set of resources needed to run a program.
- The execution of the process must proceed in a sequential manner.
- A process is a running program.

**204.** The purpose of mutual exclusion is:

- obtaining exclusive access

**205.** Inter-process communication can be organized using:

- shared memory fields accessible through system calls
- shared directly addressable memory fields
- messages

- 206.** What does it mean that the interrupt subsystem is vectored (all components of the correct answer must be given)?
- interrupts are accepted on multiple input lines
  - there is an interrupt handling table indexed by the interrupt line number
  - there is an individual interrupt mask
- 207.** The interrupt encoder is:
- a combinational circuit that computes the number of the reported and unmasked interrupt with the highest priority
  - a combinational circuit that calculates the value of a new individual interrupt mask
  - a combinational circuit that transmits to the processor the number of the interrupt to be serviced
- 208.** Which scheduling is used to organize concurrency?
- short-term
- 209.** What mechanism is part of batch systems?
- medium-term scheduler
  - long-term scheduler
- 210.** What are the sequence of actions in interrupt handling?
1. saving a copy of the interrupt vector (PC and SR)
  2. switching to system mode (modification of PC and status register)
  3. programmatic context saving
  4. switching to the system stack
- 211.** After accepting an interrupt, the next interrupts are:
- blocked
- 212.** Which scheduler is also called a job planner?
- long-term
- 213.** What exception (software or hardware interrupt) causes system mode if user mode is current?
- any exception
- 214.** In a multiprocessor operating system, interrupt blocking is sufficient to prevent the microkernel from executing its routines simultaneously.
- False
- 215.** The difference between trap and error is:
- errors are generally reported asynchronously and traps synchronously
  - after an error, there is usually no return to the program, and after a trap, yes
- 216.** In the "current" state, there is a process that:
- occupies a processor
- 217.** Devices report their readiness by:
- issuing an interrupt
  - setting a status bit
- 218.** Context switch is caused by:
- Interrupts
- 219.** The result of cooperation of concurrent processes:
- it can be non-deterministic
  - it may depend on how processes are scheduled
- 220.** The following situations cause "error" exceptions (processor internal interrupts):
- illegal instruction
  - instruction legal but prohibited in user mode

**221.** Cloning a process with a fork operation results in (not taking to account the numerical result of fork ):  
- Duplication of data segment and stack segment

**222.** The interrupt vector consists of:

- program counter
- status register
- condition bits

**223.** Which mechanisms are supported by the phenomenon of locality of references?

- page swapping
- multilevel page index tables
- reverse page index tables
- associative memory of page references

**224.** Scheduling disc access involves deciding on the following:

- The order in which disc access requests should be handled

**225.** A typical collection of program segments includes (some of them can be combined):

- Code segment
- Data segment
- Stack segment

**226.** The relocating loader generates addresses as the program is loaded into primary memory.

These addresses are:

- Absolute

Rozpoczęto	sobota, 14 czerwca 2025, 12:57
Stan	Ukończone
Ukończono	sobota, 14 czerwca 2025, 13:08
Wykorzystany czas	10 min. 53 sek.
Punkty	9,00/40,00
Ocena	6,08 pkt. na 27,00 pkt. możliwych do uzyskania (22,5%)

**Pytanie 1**

Poprawnie

Punkty: 1,00 z 1,00

W skład środowiska w którym jest realizowany proces wchodzą:

Wybierz wszystkie poprawne:

- a. Zbiór zmiennych środowiska ✓
- b. Przestrzeń adresowa procesu ✓
- c. Zawartość rejestru zgłoszeń przerwań
- d. Zawartość w jednostki zarządzania pamięcią
- e. Zawartość rejestrów ✓
- f. Otwarte pliki ✓

Twoja odpowiedź jest poprawna.

Prawidłowymi odpowiedziami są: Zbiór zmiennych środowiska, Przestrzeń adresowa procesu, Zawartość rejestrów, Otwarte pliki

**Pytanie 2**

Poprawnie

Punkty: 1,00 z 1,00

W skład środowiska w którym jest realizowany proces wchodzą:

Wybierz wszystkie poprawne:

- a. Przestrzeń adresowa procesu ✓
- b. Zawartość rejestru zgłoszeń przerwań
- c. Zbiór zmiennych środowiska ✓
- d. Zawartość rejestrów uniwersalnych ✓

Twoja odpowiedź jest poprawna.

Prawidłowymi odpowiedziami są: Zbiór zmiennych środowiska, Przestrzeń adresowa procesu, Zawartość rejestrów uniwersalnych

**Pytanie 3**

Niepoprawnie

Punkty: 0,00 z 1,00

Algorytm, w którym jest wyrzucana strona najdawniej załadowana, nazywa się (podaj skrót jeżeli jest dla tego algorytmu używany):

Odpowiedź: LRU



Poprawna odpowiedź to: FIFO

**Pytanie 4**

Niepoprawnie

Punkty: 0,00 z 1,00

System czasu rzeczywistego „twardy”:

Wybierz wszystkie poprawne:

- a. Gwarantuje czas obsługi przerwania ✗
- b. Gwarantuje średni czas reakcji
- c. Gwarantuje czas reakcji

Twoja odpowiedź jest niepoprawna.

Poprawna odpowiedź to: Gwarantuje czas reakcji

**Pytanie 5**

Niepoprawnie

Punkty: 0,00 z 1,00

Który z poniższych schematów alokacji pamięci może podlegać zewnętrznej fragmentacji?

- a. Wiele ciągłych stałych partycji o jednakowym rozmiarze
- b. Wiele ciągłych stałych partycji o różnej wielkości ✓
- c. Stronicowanie ✗
- d. Segmentacja

Prawidłowymi odpowiedziami są: Segmentacja, Wiele ciągłych stałych partycji o różnej wielkości

**Pytanie 6**

Niepoprawnie

Punkty: 0,00 z 1,00

W których algorytmach wymiany jest używana historia dostępów do strony?

Wybierz wszystkie poprawne:

- a. zegarowy zbioru roboczego
- b. LFU
- c. drugiej szansy ✗
- d. LRU
- e. NRU ✗
- f. zbioru roboczego
- g. FIFO

Twoja odpowiedź jest niepoprawna.

Prawidłowymi odpowiedziami są: LRU, LFU

**Pytanie 7**

Poprawnie

Punkty: 1,00 z 1,00

przerwanie „błąd strony” (page fault) jest zgłasiane gdy:

Wybierz wszystkie poprawne:

- a. na bieżącej stronie wystąpił błąd
- b. program wykonuje dostęp do strony której nie ma w pamięci operacyjnej ✓
- c. program wykonuje dostęp do strony której nie ma w kieszeni (pamięci podręcznej)
- d. program wykonuje dostęp do strony

Twoja odpowiedź jest poprawna.

Poprawna odpowiedź to: program wykonuje dostęp do strony której nie ma w pamięci operacyjnej

**Pytanie 8**

Nie udzielono odpowiedzi

Punkty maks.: 3,00

ramka	M	R	należy do procesu	1-używana, 0-nie
1	1	0	0	0
2	0	0	2	0
3	1	1	1	1
4	0	1	0	0
5	1	0	3	1
6	1	0	1	1
7	0	0	2	0
8	1	1	1	0

Używając powyższej tabeli, z lokalną regułą przydziału ramek, która ramka zostanie przydzielona do procesu? Strony są skanowane zaczynając od góry. Proces, dla którego ramka jest potrzebna to 2. Podaj numer ramki.

Odpowiedź:  ×

Poprawna odpowiedź to: 2

**Pytanie 9**

Nie udzielono odpowiedzi

Punkty maks.: 3,00

W przypadku metody SCAN szeregowania operacji dyskowych, aktualnie wykonywana operacja dotyczy cylindra 30. Bieżący kierunek w metodzie SCAN jest rosnący. Następne zaplanowane operacje (w kolejności ich kolejkowania) to:

Numer operacji	1	2	3	4	5
Numer cylindra	41	24	25	34	40

Dla następnej operacji dyskowej podaj odległość ruchu głowicy (w cylindrach) między bieżącą a następną operacją.

Odpowiedź:  ×

Poprawna odpowiedź to: 4

**Pytanie 10**

Nie udzielono odpowiedzi

Punkty maks.: 3,00

Przy otwarciu pliku podajemy tryb otwarcia i tryb współdzielenia.

Zakodujmy kody otwarcia:

fmOpenRead	10
fmOpenWrite	01
fmOpenReadWrite	00
fmShareDenyWrite	10
fmShareExclusive	00
fmShareDenyRead	01
fmShareDenyNone	11

Pierwszy program otworzył plik w trybie 10 i trybie współdzielenia 01

Drugi program chce otworzyć plik w trybie 00 i trybie współdzielenia 10

Czy drugi program będzie mógł otworzyć plik (0-nie, 1-tak, 2-to zależy jeszcze od innych okoliczności)?

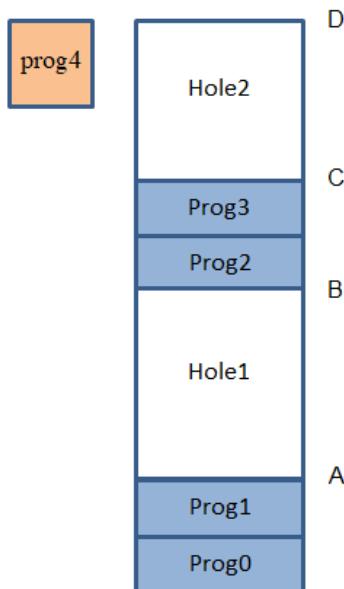
Odpowiedź:  ×

Poprawna odpowiedź to: 0

**Pytanie 11**

Poprawnie

Punkty: 3,00 z 3,00



W powyższym stanie alokacji pamięci 4 programy są już w pamięci, a 5. program czeka na załadowanie do pamięci. Granice dziur to:

- A - 2K
- B - 3K
- C - 12K
- D - 19K

Pamięć jest przydzielana programom w zasadzie pierwszego dopasowania FIRST-FIT, bez tworzenia nowej dziury, jeśli przydzielony blok jest większy niż zapotrzebowanie. Pamięć jest skanowana w poszukiwaniu dziury, zaczynając od niższych adresów.

Jaka będzie wewnętrzna fragmentacja po załadowaniu programu E o rozmiarze 5K do pamięci?

Odpowiedź:

===== for teacher =====

1 7

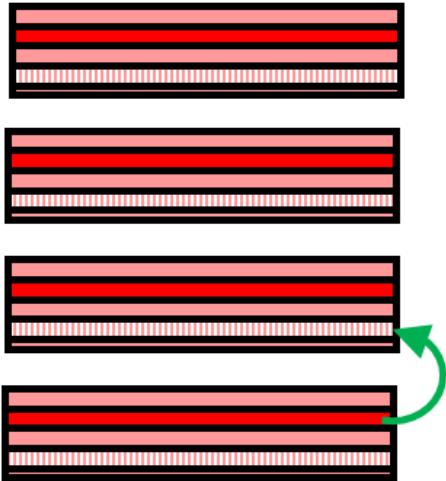
Poprawna odpowiedź to: 2

**Pytanie 12**

Niepoprawnie

Punkty: 0,00 z 3,00

Na pokazanym "zdjęciu migawkowym" stosu programu, pokazano łącznik statyczny. Stos rozwija się "w dół" Podprogram wskazywany przez strzałkę jest w hierarchii "rodzicem" podprogramu na szczytce stosu. Czy podprogram na szczytce stosu mógł zostać wywołany rekursywnie?

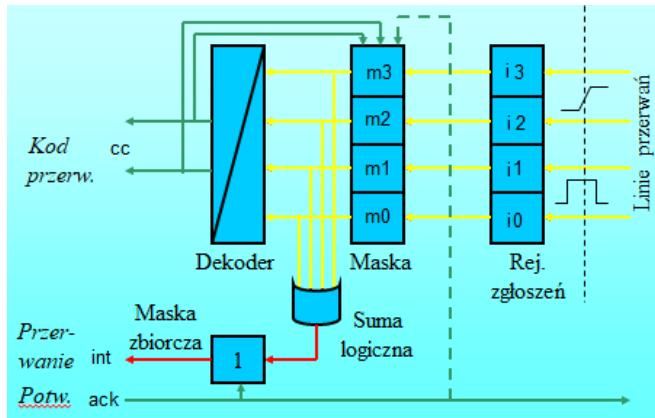
 Prawda ✗ Fałsz

Poprawną odpowiedzią jest "Fałsz".

**Pytanie 13**

Nie udzielono odpowiedzi

Punkty maks.: 3,00



W podanej strukturze układu przerwań maska przerwań ma postać 1110 (od m3 do m0), oraz są zgłoszone przerwania 0010 (od i3 do i0).

Przerwanie o indeksie 3 ma najwyższy priorytet.

Jaka będzie wartość kodu przerwania cc przesłany do procesora (podaj wartość dziesiętnie)?

Jeżeli żadne przerwanie nie zostanie zgłoszone, wpisz -1

Odpowiedź:  ×

Poprawna odpowiedź to: 1

**Pytanie 14**

Nie udzielono odpowiedzi

Punkty maks.: 3,00

Organizacja pamięci i procesora jest słownowa (int też zajmuje 1 słowo)

zmienna a ma wartość #2494

szczyt stosu (pełny zstępujący) #c800

ramka stosu przed wywołaniem podprogramu B #c81d

adres podprogramu B #085b

Zasady wywoływania: konwencja języka C, bez połączenia statycznego, wynik funkcji przekazywany w rejestrach. Zawartość stosu pokazano po wywołaniu podprogramu B, oraz potem rekursywnie przez samego siebie, w punkcie etykiety C. Podprogram B jest wywołany po raz pierwszy B(a); gdzieś w programie spod adresu #9cff. Etykieta C (adres wywołania funkcji B) ma adres #0886

niezależnie od języka programowania, podprogram B ma postać

B(i);

{

C:      B(i-2);

}

Podaj zawartość komórki pod adresem #c7fc jako liczbę heksadecymalną bez #.

Adres	zawartość
#c800	????
#c7ff	#2494
#c7fe	#9d00
#c7fd	#c81d
#c7fc	
#c7fb	#0887
#c7fa	#c7fd
#c7f9	????

Odpowiedź:



Poprawna odpowiedź to: 2492

**Pytanie 15**

Nie udzielono odpowiedzi

Punkty maks.: 3,00

Adres wirtualny składa się z 7b nr strony i 9b przemieszczenia. Tabela indeksowa stron jest ukazana poniżej (indeks, zawartość). Dla adresu równego dziesiętnie 3632, binarnie 0000 1110 0011 0000, podać adres fizyczny w postaci: nr ramki,przemieszczenie (jako liczby dziesiętne, przemieszczenie na 3 cyfrach). Na przykład dla adresu fizycznego składającego się z ramki 0 i przemieszczenia 18 należy podać 0,018. Jeżeli dla podanego adresu wirtualnego nie ma adresu fizycznego to należy podać -1.

7	4
6	5
5	7
4	-1
3	6
2	9
1	2
0	-1

Odpowiedź:  ✗

Poprawna odpowiedź to: 4,048

**Pytanie 16**

Poprawnie

Punkty: 3,00 z 3,00

Jaki jest średni czas w systemie dla zadań wsadowych, przy użyciu algorytmu SJF?

W systemie są 3 procesory

zadanie	1	2	3	4
czas przetwarzania	3,5	4,5	2,9	1,8

Odpowiedź:  ✓

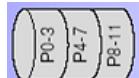
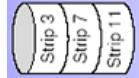
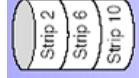
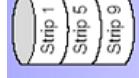
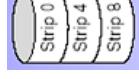
Poprawna odpowiedź to: 3,6

**Pytanie 17**

Nie udzielono odpowiedzi

Punkty maks.: 3,00

W macierzy RAID 4 dane są umieszczane w porcjach (Strips), które są "rozrzucone" po dyskach danych, tak że każda kolejna porcja znajduje się na kolejnym dysku danych, modulo liczba dysków. Do tego występuje dysk parzystości, który przechowuje bity parzystości zerowych bitów, pierwszych bitów, drugich bitów itd., porcji o równych numerach podzielonych przez liczbę dysków danych, na przykład porcji 0-3, 4-7, 8-11 itd.:

**dysk parz.****dysk 3****dysk 2****dysk 1****dysk 0**

początek porcji 0,1,2,3 wygląda następująco:

0	1	0	0	1	Dysk parz.
0	0	0	0	0	Dysk 3
1	0	1	1	0	Dysk 2
1	1	0	1	0	Dysk 1
0	1	1	0	0	Dysk 0

W porcji parzystości wartości są umieszczone tak, aby bit parzystości zachowywał nieparzystość odpowiednich bitów porcji 0-3. Dysk 3 został uszkodzony i odczytuje same 0. Po wymianie dysku na nowy, jakie wartości należy umieścić w porcji na dysku 3?

Podaj wartości kolejnych bitów na dysku 3, bez żadnych separatorów pomiędzy nimi, na przykład 00000

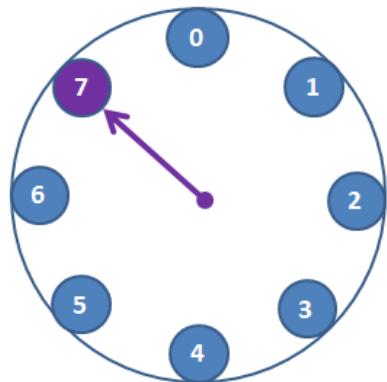
Odpowiedź:  ×

Poprawna odpowiedź to: 10110

**Pytanie 18**

Niepoprawnie

Punkty: 0,00 z 3,00



strona	4	5	6	7	0	1	2	3
bit R	1	1	1	0	1	0	1	1

Używając powyższej listy dla zegarowego algorytmu wymiany, która strona zostanie wysłana na dysk jako pierwsza? Podaj numer strony.

Bieżąca pozycja „wskaźówki” to 4 (niezależnie od pozycji na obrazku).

Odpowiedź:  ×

Poprawna odpowiedź to: 7

<b>It has started</b>	Monday, June 16, 2025, 10:39 AM
<b>Condition</b>	Completed
<b>Completed</b>	Monday, June 16, 2025, 11:52 AM
<b>Time used</b>	1 hour 13 minutes
<b>Points</b>	40.00/40.00
<b>Rate</b>	25.00 points out of 25.00 possible points ( 100 %)

**Question 1**

Correctly

Points: 1.00 out of 1.00

Discontinuous allocation is the result of:

Select all correct:

- a. relocation
- b. compaction
- c. segmentation ✓
- d. paging ✓

Your answer is correct.

The correct answers are: paging, segmantation

**Question 2**

Correctly

Points: 1.00 out of 1.00

Interrupt vector:

Select all correct:

- a. and. contains the ID of the process that should be restarted
- b. contains minimal information that cannot be saved programmatically ✓
- c. contains the instruction counter, condition bits, interrupt mask, and general purpose registers
- d. it is saved automatically when an interrupt is accepted ✓

Your answer is correct.

The correct answers are: it is saved automatically when an interrupt is accepted, contains minimal information that cannot be saved programmatically

**Pytanie 3**

Poprawnie

Punkty: 1,00 z 1,00

WORST-FIT algorithm:

Wybierz wszystkie poprawne:

- a. It allows for fast determining whether there is a free block of the required size ✓
- b. It is designed to reduce external fragmentation ✓
- c. Requires a descending sort of the list of free blocks ✓
- d. Requires sorting the cut part into the list of free blocks ✓

Twoja odpowiedź jest poprawna.

Prawidłowymi odpowiedziami są: Requires a descending sort of the list of free blocks, It allows for fast determining whether there is a free block of the required size, It is designed to reduce external fragmentation, Requires sorting the cut part into the list of free blocks

**Pytanie 4**

Poprawnie

Punkty: 1,00 z 1,00

Which of the following memory allocation schemes causes external fragmentation?

- a. Multiple contiguous fixed partitions of various sizes ✓
- b. Multiple contiguous fixed partitions of equal size
- c. Paging
- d. Sweeping ✓

Prawidłowymi odpowiedziami są: Sweeping, Multiple contiguous fixed partitions of various sizes

**Pytanie 5**

Poprawnie

Punkty: 1,00 z 1,00

What is true about system level threads?

- a. Thread switching does not require interaction with the operating system.
- b. All threads of the process execute physically simultaneously.
- c. All process threads share the same address space. ✓
- d. All process threads can share the same set of open files. ✓

Prawidłowymi odpowiedziami są: All process threads can share the same set of open files., All process threads share the same address space.

**Pytanie 6**

Poprawnie

Punkty: 1,00 z 1,00

For concurrency in OS:

- a. cache memory is necessary
- b. timer interrupts are necessary
- c. special processor support is required
- d. interrupt handling is necessary ✓

Poprawna odpowiedź to: interrupt handling is necessary

**Pytanie 7**

Poprawnie

Punkty: 1,00 z 1,00

The interrupt acceptance sequence consists of (in the sequence):

Wybierz wszystkie poprawne:

- a. identification of the interrupt level, saving the interrupt vector, performing a jump according to the interrupt table
- b. identification of the interrupt level, performing a jump according to the interrupt table, saving the interrupt vector
- c. identification of the interrupt level, saving the interrupt vector, performing a jump with a trace according to the interrupt table ✓
- d. identification of the interrupt level, performing a jump with the trace according to the interrupt table, saving the interrupt vector

Twoja odpowiedź jest poprawna.

Poprawna odpowiedź to: identification of the interrupt level, saving the interrupt vector, performing a jump with a trace according to the interrupt table

**Pytanie 8**

Poprawnie

Punkty: 3,00 z 3,00

For the disk operation scheduling Cyclic SCAN method, the currently being executed operation is in 30 cylinder. The direction in the Cyclic SCAN method is ascending. The next scheduled operations (in the order of their queuing) are:

Operation number	1	2	3	4	5
Cylinder number	41	24	25	34	40

For the next disk operation, enter the head travel distance (in cylinders) between the current and next operation.

Odpowiedź:  ✓

Poprawna odpowiedź to: 4

**Pytanie 9**

Poprawnie

Punkty: 3,00 z 3,00

When opening a file, we specify the opening mode and the sharing mode.

Let's encode the opening codes:

fmOpenRead	10
fmOpenWrite	01
fmOpenReadWrite	00
fmShareDenyWrite	10
fmShareExclusive	00
fmShareDenyRead	01
fmShareDenyNone	11

The first program opened the file in mode 01 and sharing mode 11

The second program wants to open the file in mode 00 and sharing mode 00

Will the second program be able to open the file (0-no, 1-yes, 2-it depends on other circumstances)?

Odpowiedź:  ✓

Poprawna odpowiedź to: 0

**Pytanie 10**

Poprawnie

Punkty: 3,00 z 3,00

page	M	R	belongs to process
1	0	1	3
2	1	1	3
3	0	0	4
4	1	0	6
5	0	1	2
6	0	1	5
7	1	1	5
8	0	0	5

Using the above table of the history of R bit for the pages in NRU swapping, with global frame allocation rule, which page will be sent to the disk first? The pages are scanned starting from the top. The process for which the frame is needed is 2. Provide a page number.

Odpowiedź: 3 ✓

Poprawna odpowiedź to: 3

**Pytanie 11**

Poprawnie

Punkty: 3,00 z 3,00

In RAID 4, data is placed in Strips that are "scattered" over the data disks, so that each subsequent strip is on the next data disk, modulo the number of disks. For this, there is a parity disk that holds the parity bits of zeroth bits, first bits, second bits, etc., equal-numbered strips divided by the number of data disks, for example, strips 0-3, 4-7, 8-11, etc.:



the start of strips 0,1,2,3 looks like this:

1	1	1	0	0	Parity disk
1	1	1	1	1	Disk 3
1	0	0	1	0	Disk 2
1	0	1	0	1	Disk 1
0	1	1	0	0	Disk 0

In the parity strip, the values are placed so that the parity bit keeps the corresponding strip bits 0-3 even.

Disk 3 has been corrupted and always reads 1. After replacing the disk with a new one, what values should I put in the strip on disk 3?

Enter the values of the consecutive bits on disk 3, without any separators between them, for example 00000

Odpowiedź:  ✓

Poprawna odpowiedź to: 10111

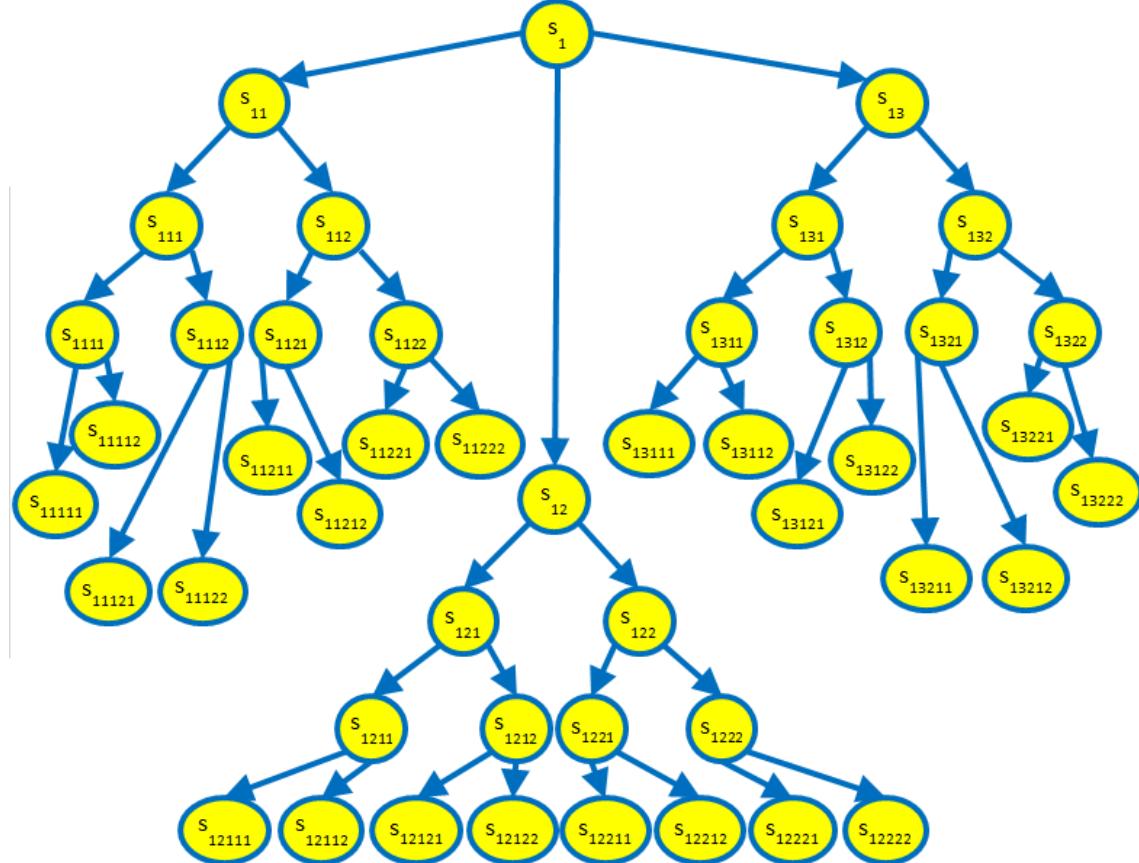
Pytanie 12

Poprawnie

Punkty: 3,00 z 3,00

The stack frame of which subroutine (specify the index) will be pointed by the static link in the frame of the subroutine S1222, that is called from the subroutine S12?

If the call is not possible, enter index -1.



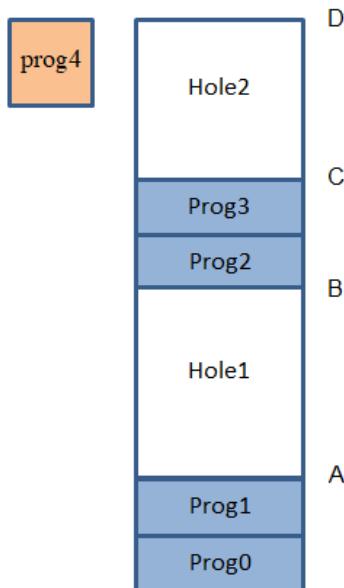
Odpowiedź:  ✓

Poprawna odpowiedź to: -1

**Pytanie 13**

Poprawnie

Punkty: 3,00 z 3,00



In the above memory allocation state, 4 programs are already in memory, and 5th program is waiting to be loaded into the memory. The borders of the holes are:

- A - 4K
- B - 6K
- C - 15K
- D - 17K

The memory is allocated to the programs in the worst-fit rule, without making a new hole if the allocated block is larger than the demand.

What will be the internal fragmentation after loading the program Prog4 of size 2K into memory?

Odpowiedź:

===== for teacher =====

22

Poprawna odpowiedź to: 0

**Pytanie 14**

Poprawnie

Punkty: 3,00 z 3,00

Assuming that memory cells are 1-byte, the page number in the address field is 13 bits, the offset is 13 bits, the frame number is 11 bits, and all entries in the TIS page index table are on a 4-byte word boundary, please specify:

- the maximum size of the physical memory in MB

Odpowiedź:

Poprawna odpowiedź to: 16

**Pytanie 15**

Poprawnie

Punkty: 3,00 z 3,00

We have the tasks with the following priorities in the access to a resource (a larger number is a higher priority):

Process number	1	2	3	4	5	6
Priority	45	44	39	38	42	31

The scheduling policy is preemptive, with the decision time constraint based on time slicing.

The current process is number 4. What process will get the resource in the nearest decision? Provide its priority.

Odpowiedź:

45



Poprawna odpowiedź to: 45

**Pytanie 16**

Poprawnie

Punkty: 3,00 z 3,00

The organization of memory and processor is word-based. A word means 16 bits. (int also takes 1 word) Hexadecimal values are preceded by a # character.

variable a has the value #a0c0

variable b has the value #a0a0

variable c has the value #a0a5

top of the stack (full descending, i.e. the stack pointer points to the most recently put element on the stack, and the stack expands towards lower addresses): #c100

address of subroutine A #1010

stack frame before calling subroutine A #c105

Calling rules: Parameters are put on the stack in accordance with the convention of the C language, i.e. starting from the last one, without a static link, the result of the function is passed in registers. The contents of the stack at label point C. Subroutine A is called A(c,b,a); from address #10a0.

regardless of the programming language, the subroutine header A has the form

A(int x,y,z);

{

    int p = z-y;

    int q = x-y;

C: ...

}

The content of the cell at address #c0fb: dynamic link



Address	content
#c100	????
#c0ff	#a0a5
#c0fe	#a0a0
#c0fd	#a0c0
#c0fc	#10a1
#c0fb	#c105
#c0fa	#0005
#c0f9	#0020
#c0f8	????

Twoja odpowiedź jest poprawna.

Poprawna odpowiedź to:

The organization of memory and processor is word-based. A word means 16 bits. (int also takes 1 word) Hexadecimal values are preceded by a # character.

variable a has the value #a0c0

variable b has the value #a0a0

variable c has the value #a0a5

top of the stack (full descending, i.e. the stack pointer points to the most recently put element on the stack, and the stack expands towards lower addresses): #c100

address of subroutine A #1010

stack frame before calling subroutine A #c105

Calling rules: Parameters are put on the stack in accordance with the convention of the C language, i.e. starting from the last one, without a static link, the result of the function is passed in registers. The contents of the stack at label point C. Subroutine A is called A(c,b,a); from address #10a0.

regardless of the programming language, the subroutine header A has the form

A(int x,y,z);

{

    int p = z-y;

    int q = x-y;

C: ...

}

The content of the cell at address #c0fb:[dynamic link]

Address	content
#c100	????
#c0ff	#a0a5
#c0fe	#a0a0
#c0fd	#a0c0
#c0fc	#10a1
#c0fb	#c105
#c0fa	#0005
#c0f9	#0020
#c0f8	????

**Pytanie 17**

Poprawnie

Punkty: 3,00 z 3,00

page	history of R
0	011000
1	011100
2	010001
3	010110
4	001011
5	001100
6	000011
7	000100

Using the above table of the history of R bit for the pages in LRU swapping, which page will be sent to the disk first? The oldest bit R is on the left. Provide a page number.

Odpowiedź:

6

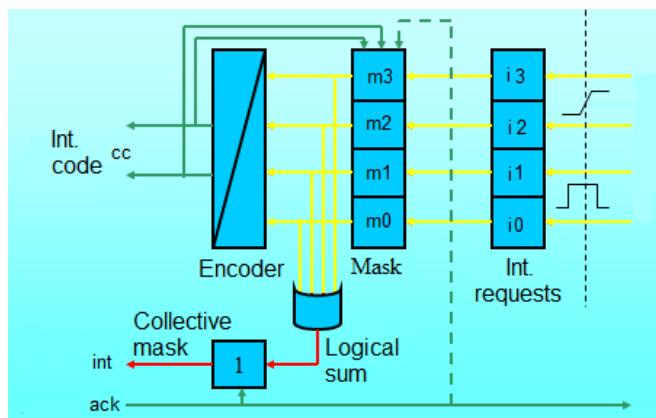


Poprawna odpowiedź to: 6

**Pytanie 18**

Poprawnie

Punkty: 3,00 z 3,00



In the given interrupt controller structure, the interrupt mask is 1110 (from m3 to m0), and interrupts 0011 (from i3 to i0) are reported.

The interrupt with index 3 has the highest priority.

What will be the value of the interrupt code cc sent to the processor (provide the code in decimal)?

If no interrupt is reported, enter -1

Odpowiedź:  ✓

Poprawna odpowiedź to: 1

<b>Started on</b>	Monday, 16 June 2025, 10:22 AM
<b>State</b>	Finished
<b>Completed on</b>	Monday, 16 June 2025, 11:44 AM
<b>Time taken</b>	1 hour 21 mins
<b>Marks</b>	36.00/40.00
<b>Grade</b>	22.50 out of 25.00 (90%)

**Question 1**

Correct

Mark 1.00 out of 1.00

Consider the following sequence of address references:

123, 215, 600, 1234, 76, 96.

If the page size is 100, the order of page references is as follows:

- a. 1,2,6,12,0,0
- b. 0,2,6,12,0,0
- c. 12,21,60,123,7,9
- d. 1,2,6,12

The correct answer is: 1,2,6,12,0,0

**Question 2**

Correct

Mark 1.00 out of 1.00

The internal state of the program supervisor layer is available for:

- a. Applications
- b. File system layer
- c. User programs
- d. OS kernel

The correct answer is: OS kernel

**Question 3**

Correct

Mark 1.00 out of 1.00

What is true for simultaneous execution in the same context?

- a. Threads minimize context switch time.
- b. A multiprocessor kernel can be concurrent
- c. The shared context forces threads to run on the same processor
- d. The use of threads ensures concurrency within the process.

The correct answers are: Threads minimize context switch time., The use of threads ensures concurrency within the process., A multiprocessor kernel can be concurrent

**Question 4**

Correct

Mark 1.00 out of 1.00

The scheduler decisions take the form:

Select one or more:

- a. change from waiting to ready state
- b. change from waiting to active state
- c. change from ready to active state
- d. change from active to ready state

Twoja odpowiedź jest poprawna.

The correct answer is: change from ready to active state

**Question 5**

Correct

Mark 1.00 out of 1.00

A memory management technique in which the system divides memory into equal-sized portions to easily manage relocation is called:

Select one or more:

- a. swapping
- b. mapping
- c. paging
- d. sweeping

Twoja odpowiedź jest poprawna.

The correct answer is: paging

**Question 6**

Incorrect

Mark 0.00 out of 1.00

The address translation function is:

Select one or more:

- a. multivalent
- b. reverse
- c. partial
- d. monotonic

Twoja odpowiedź jest niepoprawna.

The correct answers are: multivalent, partial

**Question 7**

Correct

Mark 1.00 out of 1.00

Multiprogramming is a technique in which,as a rule:

Select one or more:

- a. many programs can be stored in primary memory
- b. is a method of allocating processor time
- c. is a memory allocation method by which a program is divided into equal parts
- d. only addresses that can be generated by the processor when performing calculations are used

Twoja odpowiedź jest poprawna.

The correct answer is: many programs can be stored in primary memory

**Question 8**

Correct

Mark 3.00 out of 3.00

For the disk operation scheduling Cyclic SCAN method, the currently being executed operation is in 33 cylinder. The direction in the Cyclic SCAN method is descending. The next scheduled operations (in the order of their queuing) are:

Operation number	1	2	3	4	5
Cylinder number	40	41	28	29	25

For the next disk operation, enter the head travel distance (in cylinders) between the current and next operation.

Answer: 4

The correct answer is: 4

**Question 9**

Correct

Mark 3.00 out of 3.00

When opening a file, we specify the opening mode and the sharing mode.

Let's encode the opening codes:

fmOpenRead	10
fmOpenWrite	01
fmOpenReadWrite	00
fmShareDenyWrite	10
fmShareExclusive	00
fmShareDenyRead	01
fmShareDenyNone	11

The first program opened the file in mode 01 and sharing mode 01

The second program wants to open the file in mode 00 and sharing mode 00

Will the second program be able to open the file (0-no, 1-yes, 2-it depends on other circumstances)?

Answer:

The correct answer is: 0

**Question 10**

Correct

Mark 3.00 out of 3.00

page	Last used	Bit R	belongs to process
1	93	1	2
2	92	0	5
3	95	0	6
4	94	0	3
5	89	1	4
6	88	1	3
7	91	0	3
8	90	1	3

Using the above table of the history of R bit for the pages in Workset swapping algorithm, with priority frame allocation method, which page will be sent to the disk first? The current time slice number is 96, and the time range  $\tau$  for the workset is 3 (the threshold  $96-\tau=93$ ). Page scan starts from the top. The current process that needs a page to be loaded is 4. A process number is its priority (the greater number, the higher priority). Provide a page number to be sent to the disk.

Answer: 

The correct answer is: 7

**Question 11**

Correct

Mark 3.00 out of 3.00

In RAID 4, data is placed in Strips that are "scattered" over the data disks, so that each subsequent strip is on the next data disk, modulo the number of disks. For this, there is a parity disk that holds the parity bits of zeroth bits, first bits, second bits, etc., equal-numbered strips divided by the number of data disks, for example, strips 0-3, 4-7, 8-11, etc.:

the start of strips 0,1,2,3 looks like this:

1	1	1	0	0	Parity disk
0	0	0	0	0	Disk 3
1	0	0	1	0	Disk 2
1	1	0	1	0	Disk 1
0	1	1	0	0	Disk 0

In the parity strip, the values are placed so that the parity bit keeps the corresponding strip bits 0-3 even.

Disk 3 has been damaged and reads only 0. After replacing the disk with a new one, what values should be put in the strip on disk 3?

Enter the values of the consecutive bits on disk 3, without any separators between them, for example 00000

Answer:

The correct answer is: 11000

**Question 12**

Correct

Mark 3.00 out of 3.00

The figure shows the static nesting structure of subroutines. Subroutine s1212 makes a recursive call. To what stack frame (of which subroutine) will be the static link in the recursively called subroutine frame?

Enter the name of the subroutine with the index, without the letter "s", e.g. for s11122, enter 11122

Answer:

The correct answer is: 121

**Question 13**

Correct

Mark 3.00 out of 3.00

In the above memory allocation state, 4 programs are already in memory, and 5th program is waiting to be loaded into the memory. The borders of the holes are:

- A - 4K
- B - 6K
- C - 13K
- D - 17K

The memory is allocated to the programs in the worst-fit rule, without making a new hole if the allocated block is larger than the demand.

What will be the internal fragmentation after loading the program Prog4 of size 1K into memory?

Answer:

===== for teacher =====

2 4

The correct answer is: 3

**Question 14**

Correct

Mark 3.00 out of 3.00

Assuming that memory cells are 1-byte, the page number in the address field is 13 bits, the offset is 13 bits, the frame number is 11 bits, and all entries in the TIS page index table are on a 4-byte word boundary, specify:

- TIS maximum size of the program in kB

Answer:

The correct answer is: 32

**Question 15**

Correct

Mark 3.00 out of 3.00

What is the average time in the system for tasks in the batch, using SJF algorithm?

task	1	2	3	4
processing time	3.8	4.5	2.6	1.2

Answer: 6.175

The correct answer is: 6.2

**Question 16**

Incorrect

Mark 0.00 out of 3.00

The stack is full descending, that is, the stack pointer points to the most recently put element on the stack, and the stack expands towards lower addresses. Memory is byte-organized (individual bytes are addressed). Every piece of data occupies 8 bytes (also, memory cells and general-purpose registers). Parameters are pushed on the stack by C convention, starting with the last one. The static link is pushed on the stack after the parameters. The subroutine has local variables: 4, which occupy 1 memory cell each. After calling the subroutine with parameters: 4, occupying 1 memory cell each, the trace will be at the address relative to the SP (decimal number should be entered):

Answer: 32

The correct answer is: 40

**Question 17**

Correct

Mark 3.00 out of 3.00

page	6	7	0	1	2	3	4	5
R bit	1	1	1	0	1	0	1	0

Using the above list for the Clock swapping algorithm, which page will be sent to the disk first? Provide a page number.

The current position of the "arrow" is 6 (regardless of the position in the picture), and the algorithm works clockwise.

Answer: 1

The correct answer is: 1

**Question 18**

Correct

Mark 3.00 out of 3.00

In the given interrupt controller structure, the interrupt mask is 1110 (from m3 to m0), and interrupts 0010 (from i3 to i0) are reported.

The interrupt with index 3 has the highest priority.

What will be the new value of the interrupt mask? Provide the bits .m3m2m1m0 (mask preceded by a point), for example .0101

Answer:

The correct answer is: 0.1100

<b>Started on</b>	Monday, 16 June 2025, 10:06 AM
<b>State</b>	Finished
<b>Completed on</b>	Monday, 16 June 2025, 11:51 AM
<b>Time taken</b>	1 hour 44 mins
<b>Marks</b>	31.00/40.00
<b>Grade</b>	19.38 out of 25.00 (77.5%)

**Question 1**

Correct

Mark 1.00 out of 1.00

When the processor is released, the scheduler selects one of the queued processes:

Select one or more:

- a. running
- b. ready ✓
- c. suspended
- d. waiting

Twoja odpowiedź jest poprawna.

The correct answer is: ready

**Question 2**

Correct

Mark 1.00 out of 1.00

The thread is also called:

- a. lightweight process ✓
- b. heavy process
- c. overlay process
- d. data process

The correct answer is: lightweight process

**Question 3**

Correct

Mark 1.00 out of 1.00

Which swapping algorithms use the history of page references (when was it last used or in which time slices was it used)?

Select one or more:

- a. working set ✓
- b. NRU
- c. LRU ✓
- d. clock
- e. FIFO
- f. second chance ✓
- g. LFU ✓
- h. no algorithm

Twoja odpowiedź jest poprawna.

The correct answers are: second chance, LRU, LFU, working set

**Question 4**

Correct

Mark 1.00 out of 1.00

The hardware resources of a computer system are:

Select one or more:

- a. Virtual memory
- b. Processor time ✓
- c. Peripheral devices ✓
- d. Windows on the screen

Twoja odpowiedź jest poprawna.

The correct answers are: Processor time, Peripheral devices

**Question 5**

Correct

Mark 1.00 out of 1.00

Collective interrupt mask is:

Select one or more:

- a. a register that blocks or unlocks a non-maskable interrupt
- b. a register that blocks or unblocks all interrupts ✓
- c. register in which the address of the interrupt controller is stored
- d. a combinational circuit that calculates the number of the interrupt received

Twoja odpowiedź jest poprawna.

The correct answer is: a register that blocks or unblocks all interrupts

**Question 6**

Correct

Mark 1.00 out of 1.00

Page Index Table address is kept in:

Select one or more:

- a. page table base register ✓
- b. page register
- c. stack pointer
- d. program counter

Twoja odpowiedź jest poprawna.

The correct answer is: page table base register

**Question 7**

Correct

Mark 1.00 out of 1.00

A concurrent system is one that, in principle:

Select one or more:

- a. It runs on a multiprocessor computer
- b. It allows multiple programs/processes/threads to run physically simultaneously
- c. Requires the use of timer interrupts
- d. Allows multiple programs/processes/threads to run simultaneously or seemingly simultaneously ✓

Twoja odpowiedź jest poprawna.

The correct answer is: Allows multiple programs/processes/threads to run simultaneously or seemingly simultaneously

**Question 8**

Correct

Mark 3.00 out of 3.00

For the disk operation scheduling Cyclic SCAN method, the currently being executed operation is in 49 cylinder. The direction in the Cyclic SCAN method is ascending. The next scheduled operations (in the order of their queuing) are:

Operation number	1	2	3	4	5
Cylinder number	60	43	46	53	59

For the next disk operation, enter the head travel distance (in cylinders) between the current and next operation.

Answer:  ✓

The correct answer is: 4

**Question 9**

Correct

Mark 3.00 out of 3.00

When opening a file, we specify the opening mode and the sharing mode.

Let's encode the opening codes:

fmOpenRead	10
fmOpenWrite	01
fmOpenReadWrite	00
fmShareDenyWrite	10
fmShareExclusive	00
fmShareDenyRead	01
fmShareDenyNone	11

The first program opened the file in mode 00 and sharing mode 01

The second program wants to open the file in mode 00 and sharing mode 00

Will the second program be able to open the file (0-no, 1-yes, 2-it depends on other circumstances)?

Answer:  

The correct answer is: 0

**Question 10**

Correct

Mark 3.00 out of 3.00

page	Last used	Bit R	belongs to process
1	93	1	2
2	92	0	5
3	95	0	6
4	94	0	3
5	89	1	4
6	88	1	3
7	91	0	3
8	90	1	3

Using the above table of the history of R bit for the pages in Workset swapping algorithm, with priority frame allocation method, which page will be sent to the disk first? The current time slice number is 96, and the time range  $\tau$  for the workset is 3 (the threshold  $96-\tau=93$ ). Page scan starts from the top. The current process that needs a page to be loaded is 4. A process number is its priority (the greater number, the higher priority). Provide a page number to be sent to the disk.

Answer:  ✓

The correct answer is: 7

**Question 11**

Incorrect

Mark 0.00 out of 3.00

In RAID 4, data is placed in Strips that are "scattered" over the data disks, so that each subsequent strip is on the next data disk, modulo the number of disks. For this, there is a parity disk that holds the parity bits of zeroth bits, first bits, second bits, etc., equal-numbered strips divided by the number of data disks, for example, strips 0-3, 4-7, 8-11, etc.:



the start of strips 0,1,2,3 looks like this:

0	1	0	0	1	Parity disk
0	0	0	0	0	Disk 3
1	0	1	1	0	Disk 2
1	0	1	0	1	Disk 1
0	1	1	0	0	Disk 0

In the parity strip, the values are placed so that the parity bit keeps the corresponding strip bits 0-3 odd.

Disk 3 has been damaged and reads only 0. After replacing the disk with a new one, what values should be put in the strip on disk 3?

Enter the values of the consecutive bits on disk 3, without any separators between them, for example 00000

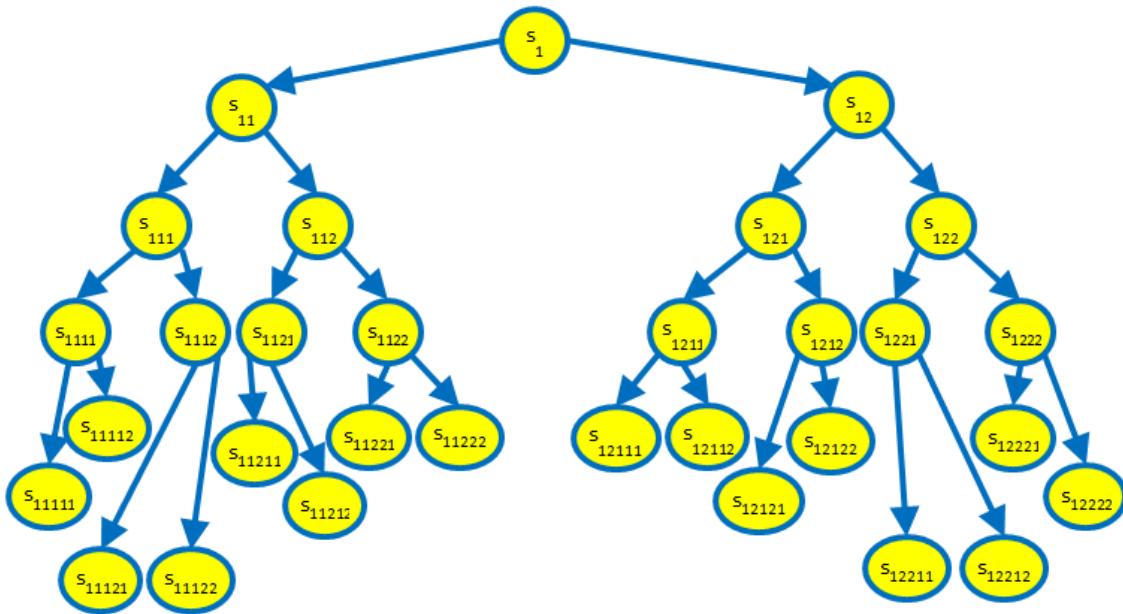
Answer:  ×

The correct answer is: 11001

**Question 12**

Correct

Mark 3.00 out of 3.00



Above is the nesting structure of subroutines in some program. Subroutine s121 calls its "parent" in the hierarchy. To what stack frame (which subroutine) will the dynamic link be made in the called subroutine frame?

Enter the name of the subroutine with the index, without the letter "s", e.g. for s1112 enter 11122

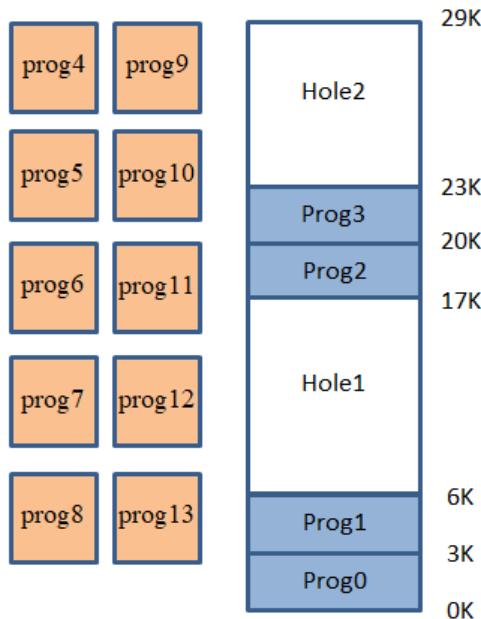
Answer: 121 ✓

The correct answer is: 121

**Question 13**

Correct

Mark 3.00 out of 3.00



In the above memory allocation state, 4 programs are already in memory, and 9 programs are waiting to be loaded into the memory, in the reverse order of their numbers. The programs waiting to be loaded into memory have the following sizes:

prog4 - 5K  
 prog5 - 7K  
 prog6 - 4K  
 prog7 - 6K  
 prog8 - 4K  
 prog9 - 4K  
 prog10 - 2K  
 prog11 - 4K  
 prog12 - 5K

The memory is allocated to the programs in the best-fit rule, with making a new hole if the allocated block is larger than the demand.

The programs are loaded into the memory in reverse order of their numbers (from 12 to 4).

Specify, which program will cause the memory compaction. Provide only the program number. If the compaction will not be needed, provide 0.

Answer:

The correct answer is: 8

**Question 14**

Incorrect

Mark 0.00 out of 3.00

Assuming that the instruction is 32 bits, the data accessed in the instructions is 2 or 4 bytes, the memory access addressing is on a double word (4 bytes) boundary, and the page size is 4kB, one instruction can cause the following number of "page fault" exceptions:

Answer:

6



The correct answer is: 2

**Question 15**

Correct

Mark 3.00 out of 3.00

We have the tasks with the following priorities in the access to a resource (a larger number is a higher priority):

Process number	1	2	3	4	5	6
Priority	40	41	32	33	33	28

The scheduling policy is preemptive, with the decision time constraint based on time slicing.

The current process is number 4. What process will get the resource in the nearest decision? Provide its priority.

Answer:

41



The correct answer is: 41

**Question 16**

Correct

Mark 3.00 out of 3.00

The organization of memory and processor is word. A word means 16 bits (int also takes one 16-bit word). Hexadecimal values are preceded by a # character.

variable a has the value #a0c0

top of the stack (full descending, i.e. the stack pointer points to the most recently put element on the stack, and the stack expands towards lower addresses) is #c100

stack frame before calling subroutine A: #c105

address of subroutine A #1001

Calling rules: Parameters are put on the stack in accordance with the convention of the C language, i.e. starting from the last one, without a static link, the result of the function is passed in registers. The stack is shown after subroutine A is called, at label point C. Subroutine A is called A(a,a,a); from address #1050.

Regardless of the programming language, subroutine A has the form

A(int x,y,z);

{

    int q = x+0x20;

C: ...

}

Specify what cell #c0fb contains:  ✓

Address	content	
#c100	????	
#c0ff	#a0c0	
#c0fe	#a0c0	
#c0fd	#a0c0	
#c0fc	#1051	
#c0fb	#c105	
#c0fa	#a0e0	
#c0f9	????	
#c0f8	????	

Twoja odpowiedź jest poprawna.

The correct answer is:

The organization of memory and processor is word. A word means 16 bits (int also takes one 16-bit word). Hexadecimal values are preceded by a # character.

variable a has the value #a0c0

top of the stack (full descending, i.e. the stack pointer points to the most recently put element on the stack, and the stack expands towards lower addresses) is #c100

stack frame before calling subroutine A: #c105

address of subroutine A #1001

Calling rules: Parameters are put on the stack in accordance with the convention of the C language, i.e. starting from the last one, without a static link, the result of the function is passed in registers. The stack is shown after subroutine A is called, at label point C. Subroutine A is called A(a,a,a); from address #1050.

Regardless of the programming language, subroutine A has the form

A(int x,y,z);

{

    int q = x+0x20;

C: ...

}

Specify what cell #c0fb contains:[dynamic link]

Address	content	
#c100	????	
#c0ff	#a0c0	
#c0fe	#a0c0	
#c0fd	#a0c0	
#c0fc	#1051	
#c0fb	#c105	
#c0fa	#a0e0	
#c0f9	????	
#c0f8	????	

**Question 17**

Correct

Mark 3.00 out of 3.00

page	M	R
1	1	0
2	0	0
3	0	1
4	0	1
5	1	0
6	0	0
7	0	1
8	1	1

Using the above table of the history of R bit for the pages in NRU swapping, which page will be sent to the disk first? The pages are scanned starting from the top. Provide a page number.

Answer:

2

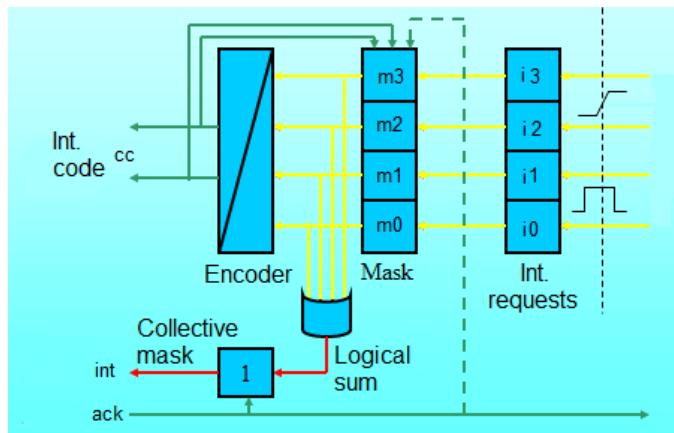


The correct answer is: 2

**Question 18**

Incorrect

Mark 0.00 out of 3.00



In the given interrupt controller structure, the interrupt mask is 0000 (from m3 to m0), and interrupts 1010 (from i3 to i0) are reported.

The interrupt with index 3 has the highest priority.

What will be the value of the interrupt code cc sent to the processor (provide the code in decimal)?

If no interrupt is reported, enter -1

Answer:  X

The correct answer is: -1

Rozpoczęto	poniedziałek, 16 czerwca 2025, 10:52
Stan	Ukończone
Ukończono	poniedziałek, 16 czerwca 2025, 11:52
Wykorzystany czas	59 min. 43 sek.
Punkty	28,67/40,00
Ocena	17,92 pkt. na 25,00 pkt. możliwych do uzyskania (71,67%)

**Pytanie 1**

Poprawnie

Punkty: 1,00 z 1,00

Paging - the key in associative memory is:

Wybierz wszystkie poprawne:

- a. frame number
- b. the frame number concatenated with the page number
- c. page number ✓
- d. the page number concatenated with the frame number

Twoja odpowiedź jest poprawna.

Poprawna odpowiedź to: page number

**Pytanie 2**

Częściowo poprawnie

Punkty: 0,50 z 1,00

WORST-FIT algorithm:

Wybierz wszystkie poprawne:

- a. Requires a descending sort of the list of free blocks ✓
- b. Requires sorting the cut part into the list of free blocks ✓
- c. It allows for fast determining whether there is a free block of the required size
- d. It is designed to reduce external fragmentation

Twoja odpowiedź jest częściowo poprawna.

Poprawnie wybrałeś (-łaś): 2.

Prawidłowymi odpowiedziami są: Requires a descending sort of the list of free blocks, It allows for fast determining whether there is a free block of the required size, It is designed to reduce external fragmentation, Requires sorting the cut part into the list of free blocks

**Pytanie 3**

Niepoprawnie

Punkty: 0,00 z 1,00

LRU algorithm consists in:

Wybierz wszystkie poprawne:

- a. Ejecting the most recently used page from memory
- b. Removing the least used page from memory ✗
- c. Downloading to memory the page that is most often needed
- d. Downloading to the memory of the page that will be needed as soon as possible

Twoja odpowiedź jest niepoprawna.

Poprawna odpowiedź to: Ejecting the most recently used page from memory

**Pytanie 4**

Częściowo poprawnie

Punkty: 0,67 z 1,00

The interrupt encoder is:

Wybierz wszystkie poprawne:

- a. a register that tells the processor the interrupt number to be handled
- b. a combinational circuit that calculates the value of a new individual interrupt mask
- c. a combinational circuit that computes the number of the reported and unmasked interrupt with the highest priority ✓
- d. a combinational circuit that transmits to the processor the number of the interrupt to be serviced ✓

Twoja odpowiedź jest częściowo poprawna.

Poprawnie wybrałeś (-łaś): 2.

Prawidłowymi odpowiedziami są: a combinational circuit that computes the number of the reported and unmasked interrupt with the highest priority, a combinational circuit that calculates the value of a new individual interrupt mask, a combinational circuit that transmits to the processor the number of the interrupt to be serviced

**Pytanie 5**

Częściowo poprawnie

Punkty: 0,50 z 1,00

Interrupt handling - sequence of actions:

1. saving a copy of the interrupt vector (PC and SR) ✓
2. switching to system mode (modification of PC and status register) ✓
3. switching to the system stack ✗
4. programmatic context saving ✗

Twoja odpowiedź jest częściowo poprawna.

Poprawnie wybrałeś (-łaś): 2.

Poprawna odpowiedź to: 1. → saving a copy of the interrupt vector (PC and SR), 2. → switching to system mode (modification of PC and status register), 3. → programmatic context saving, 4. → switching to the system stack

**Pytanie 6**

Poprawnie

Punkty: 1,00 z 1,00

The hardware mechanisms necessary for paging are

(note: "frame error" is also called "page fault", "frame fault"):

Wybierz wszystkie poprawne:

- a. Address translation, page index tables, "frame error" interrupt, associative memory, page swapper
- b. Address translation, page index tables, "frame error" interrupt ✓
- c. Address translation, page index tables, page reference bits, "frame error" interrupt
- d. Address translation, page index tables, page reference bits, "frame error" interrupt, associative memory

Twoja odpowiedź jest poprawna.

Poprawna odpowiedź to: Address translation, page index tables, "frame error" interrupt

**Pytanie 7**

Poprawnie

Punkty: 1,00 z 1,00

Conditional variables in a monitor

Wybierz wszystkie poprawne:

- a. They guard access to the critical region of the monitor
- b. They are used to suspend processes that cannot run because the conditions for their continuation are not met ✓
- c. They are used to check whether the conditions for process continuation are met

Twoja odpowiedź jest poprawna.

Poprawna odpowiedź to: They are used to suspend processes that cannot run because the conditions for their continuation are not met

**Pytanie 8**

Poprawnie

Punkty: 3,00 z 3,00

For the disk operation scheduling Cyclic SCAN method, the currently being executed operation is in 33 cylinder. The direction in the Cyclic SCAN method is descending. The next scheduled operations (in the order of their queuing) are:

Operation number	1	2	3	4	5
Cylinder number	42	41	30	31	25

For the next disk operation, enter the head travel distance (in cylinders) between the current and next operation.

Odpowiedź:

Poprawna odpowiedź to: 2

**Pytanie 9**

Poprawnie

Punkty: 3,00 z 3,00

When opening a file, we specify the opening mode and the sharing mode.

Let's encode the opening codes:

fmOpenRead	10
fmOpenWrite	01
fmOpenReadWrite	00
fmShareDenyWrite	10
fmShareExclusive	00
fmShareDenyRead	01
fmShareDenyNone	11

The first program opened the file in mode 01 and sharing mode 11

The second program wants to open the file in mode 00 and sharing mode 00

Will the second program be able to open the file (0-no, 1-yes, 2-it depends on other circumstances)?

Odpowiedź:

Poprawna odpowiedź to: 0

**Pytanie 10**

Niepoprawnie

Punkty: 0,00 z 3,00

frame	M	R	belongs to process (0-not used)
1	0	1	5
2	1	1	0
3	0	0	0
4	1	0	1
5	0	1	0
6	0	1	4
7	1	1	4
8	0	0	3

Using the above table, with the fixed frame allocation rule, which frame will be allocated to the process? The pages are scanned starting from the top. The process for which the frame is needed is 4. Provide a frame number.

Odpowiedź:  ×

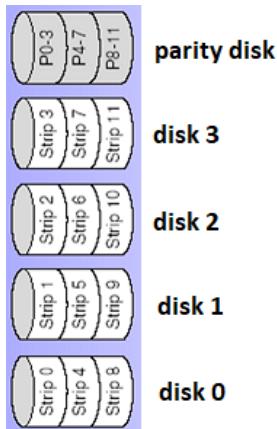
Poprawna odpowiedź to: 2

**Pytanie 11**

Poprawnie

Punkty: 3,00 z 3,00

In RAID 4, data is placed in Strips that are "scattered" over the data disks, so that each subsequent strip is on the next data disk, modulo the number of disks. For this, there is a parity disk that holds the parity bits of zeroth bits, first bits, second bits, etc., equal-numbered strips divided by the number of data disks, for example, strips 0-3, 4-7, 8-11, etc.:



the start of strips 0,1,2,3 looks like this:

1	1	1	0	0	Parity disk
0	0	0	0	0	Disk 3
1	0	0	1	0	Disk 2
1	0	1	0	1	Disk 1
0	1	1	0	0	Disk 0

In the parity strip, the values are placed so that the parity bit keeps the corresponding strip bits 0-3 even.

Disk 3 has been damaged and reads only 0. After replacing the disk with a new one, what values should be put in the strip on disk 3?

Enter the values of the consecutive bits on disk 3, without any separators between them, for example 00000

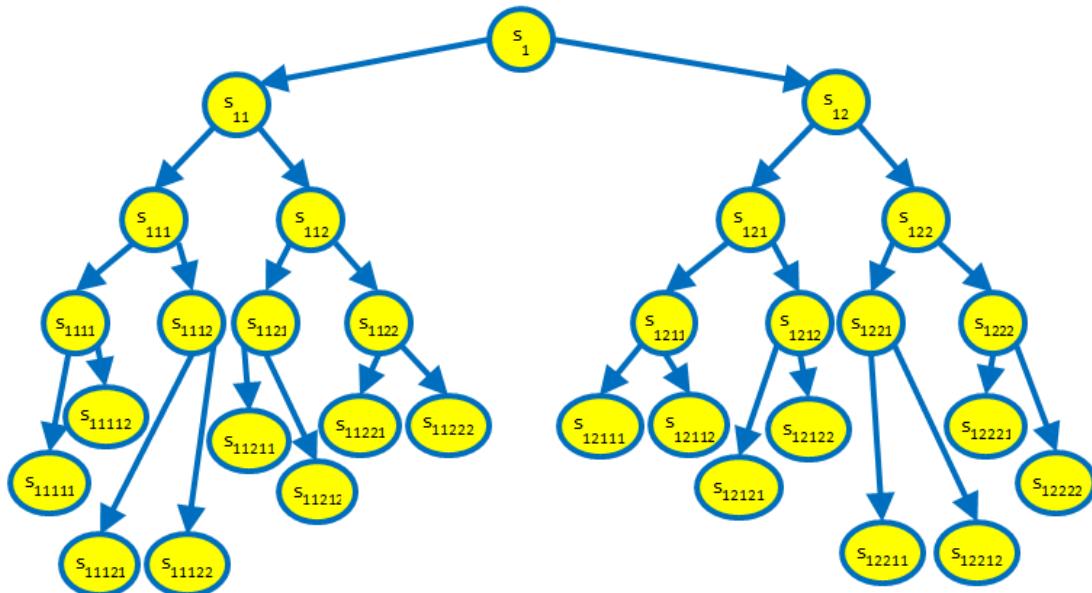
Odpowiedź:  ✓

Poprawna odpowiedź to: 10111

**Pytanie 12**

Niepoprawnie

Punkty: 0,00 z 3,00



Above is the nesting structure of subroutines in some program.

Can there be a dynamic link in subroutine frame s11111 to subroutine frame s11111 ?

answer 0-no, 1-yes

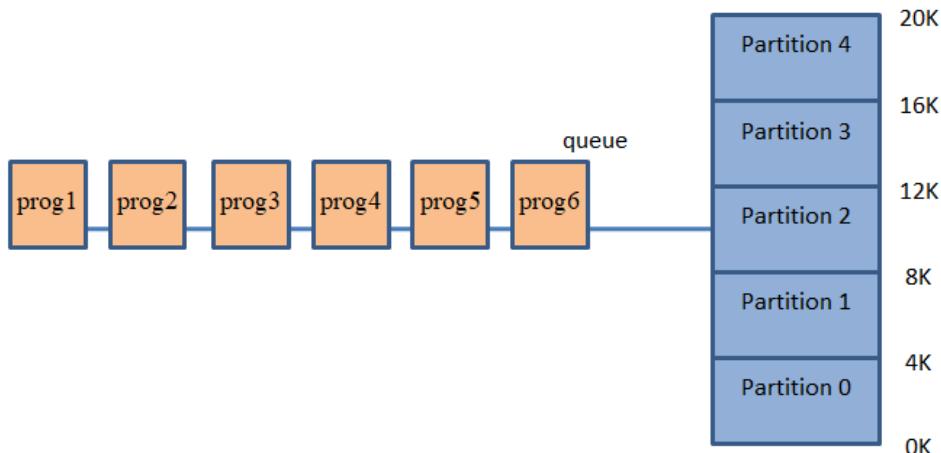
Odpowiedź:  ✗

Poprawna odpowiedź to: 1

**Pytanie 13**

Poprawnie

Punkty: 3,00 z 3,00



In the above memory division, the programs waiting to be loaded into memory have the following sizes:

- prog1 - 4K
- prog2 - 5K
- prog3 - 4K
- prog4 - 6K
- prog5 - 6K
- prog6 - 5K

Programs are loaded into memory partitions (if possible) in the reverse order of their numbers, from 6 to 1.

Specify, which program will face the internal fragmentation problem as the first. Provide only the program number. If the internal fragmentation cannot occur, enter 0.

Odpowiedź:



Poprawna odpowiedź to: 0

**Pytanie 14**

Poprawnie

Punkty: 3,00 z 3,00

The virtual address consists of 6b page number and 10b offset. The page index table is shown below (index, content). For decimal address 6192, binary 0001 1000 0011 0000, specify the physical address in the form: frame number.offset (as decimal numbers, offset in 3 digits). For example, for a physical address consisting of frame 0 and offset 18, specify 0.018. If there is no physical address for the given virtual address, then -1 should be specified.

7	12
6	0
5	7
4	-1
3	9
2	5
1	3
0	-1

Odpowiedź:  ✓

Poprawna odpowiedź to: 0,048

**Pytanie 15**

Poprawnie

Punkty: 3,00 z 3,00

What is the average time in the system for tasks in the batch, using SJF algorithm?

task	1	2	3	4
processing time	3,4	5,3	2,3	1,1

Odpowiedź:  ✓

Poprawna odpowiedź to: 5,8

**Pytanie 16**

Poprawnie

Punkty: 3,00 z 3,00

The organization of memory and processor is word. A word means 16 bits (int also takes one 16-bit word). Hexadecimal values are preceded by a # character.

variable a has the value #a0c0

top of the stack (full descending, i.e. the stack pointer points to the most recently put element on the stack, and the stack expands towards lower addresses) is #c100

stack frame before calling subroutine A: #c105

address of subroutine A #1001

Calling rules: Parameters are put on the stack in accordance with the convention of the C language, i.e. starting from the last one, without a static link, the result of the function is passed in registers. The stack is shown after subroutine A is called, at label point C. Subroutine A is called A(a,a,a); from address #1050.

Regardless of the programming language, subroutine A has the form

A(int x,y,z);

{

    int q = x+0x20;

C: ...

}

Specify what cell #c0fe contains:  ✓

Address	content	
#c100	????	
#c0ff	#a0c0	
#c0fe	#a0c0	
#c0fd	#a0c0	
#c0fc	#1051	
#c0fb	#c105	
#c0fa	#a0e0	
#c0f9	????	
#c0f8	????	

Twoja odpowiedź jest poprawna.

Poprawna odpowiedź to:

The organization of memory and processor is word. A word means 16 bits (int also takes one 16-bit word). Hexadecimal values are preceded by a # character.

variable a has the value #a0c0

top of the stack (full descending, i.e. the stack pointer points to the most recently put element on the stack, and the stack expands towards lower addresses) is #c100

stack frame before calling subroutine A: #c105

address of subroutine A #1001

Calling rules: Parameters are put on the stack in accordance with the convention of the C language, i.e. starting from the last one, without a static link, the result of the function is passed in registers. The stack is shown after subroutine A is called, at label point C. Subroutine A is called A(a,a,a); from address #1050.

Regardless of the programming language, subroutine A has the form

```
A(int x,y,z);
{
    int q = x+0x20;
C: ...
}
```

Specify what cell #c0fe contains:[parameter y]

Address	content
#c100	????
#c0ff	#a0c0
#c0fe	#a0c0
#c0fd	#a0c0
#c0fc	#1051
#c0fb	#c105
#c0fa	#a0e0
#c0f9	????
#c0f8	????

Pytanie 17

Niepoprawnie

Punkty: 0,00 z 3,00

page nr	1	2	3	4	5	6	7	8	9
loaded	2	7	15	23	25	35	53	60	62
R bit	1	1	0	1	1	1	1	1	1

Using the above list for the FIFO-second chance swapping algorithm, what will be the bottom row after page replacement execution? The middle row is the number of a time slice in which a page was loaded to a frame. Provide a sequence of bits R for the pages; for example, before page replacement, the bottom row has the image 11011111. We assume that the loaded page gets R=0.

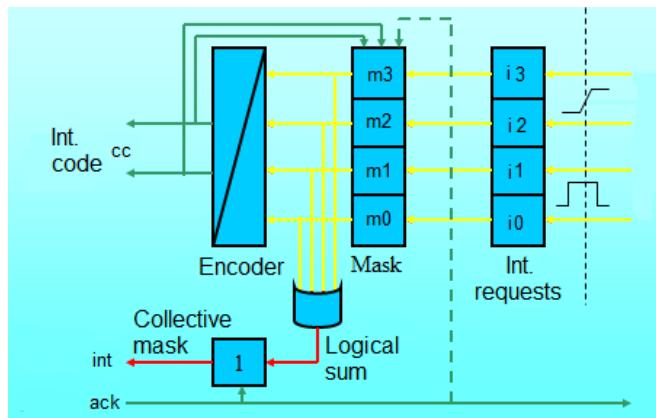
Odpowiedź: 00011111 ✖

Poprawna odpowiedź to: 111111100

**Pytanie 18**

Poprawnie

Punkty: 3,00 z 3,00



In the given interrupt controller structure, the interrupt mask is 1111 (from m3 to m0), and interrupts 1111 are reported (from i3 to i0).

The interrupt with index 3 has the highest priority.

What will be the value of the interrupt code cc sent to the processor (provide the code in decimal)?

If no interrupt is reported, enter -1

Odpowiedź:  ✓

Poprawna odpowiedź to: 3

<b>Started on</b>	Monday, 16 June 2025, 10:27 AM
<b>State</b>	Finished
<b>Completed on</b>	Monday, 16 June 2025, 11:24 AM
<b>Time taken</b>	56 mins 58 secs
<b>Marks</b>	34.00/40.00
<b>Grade</b>	21.25 out of 25.00 (85%)

**Question 1**

Correct

Mark 1.00 out of 1.00

In UNIX, access rights are attributes:

Select one or more:

- a. A directory entry for a file
- b. User descriptor
- c. An entry in the I-node table ✓
- d. A special table specifying access rights

Twoja odpowiedź jest poprawna.

The correct answer is: An entry in the I-node table

**Question 2**

Correct

Mark 1.00 out of 1.00

Semaphore function is to:

- a. memory management
- b. process scheduling
- c. synchronize critical resources to prevent deadlock ✓
- d. synchronize processes for better CPU utilization

The correct answer is: synchronize critical resources to prevent deadlock

**Question 3**

Correct

Mark 1.00 out of 1.00

What paging element is NOT used in real-time systems?

Select one or more:

- a. reference bits
- b. protection bits
- c. address translation
- d. page swapping ✓

Twoja odpowiedź jest poprawna.

The correct answer is: page swapping

**Question 4**

Correct

Mark 1.00 out of 1.00

In a multitasking environment, the operating system decides which task the CPU gets, when, and for how long. This feature is called:

- a. task management
- b. task timetable management
- c. task scheduling ✓
- d. traffic control

The correct answer is: task scheduling

**Question 5**

Correct

Mark 1.00 out of 1.00

Dynamic relocation is performed by:

- a. Compiler
- b. Linker
- c. Special registers (DATUM) ✓
- d. Loader

The correct answer is: Special registers (DATUM)

**Question 6**

Correct

Mark 1.00 out of 1.00

The operating system plays the following role in a computer system:

Select one or more:

- a. relational database management
- b. computer system resource management ✓
- c. Create a concurrent environment ✓
- d. creating abstraction (virtualization) of hardware ✓

Twoja odpowiedź jest poprawna.

The correct answers are: Create a concurrent environment, computer system resource management, creating abstraction (virtualization) of hardware

**Question 7**

Correct

Mark 1.00 out of 1.00

For address translation, the following is used:

Select one or more:

- a. index table ✓
- b. associative translation buffer ✓
- c. reference and protection bits
- d. translation register

Twoja odpowiedź jest poprawna.

The correct answers are: index table, associative translation buffer

**Question 8**

Correct

Mark 3.00 out of 3.00

For the disk operation scheduling SCAN method, the currently being executed operation is in 40 cylinder. The direction in the SCAN method is descending. The next scheduled operations (in the order of their queuing) are:

Operation number	1	2	3	4	5
Cylinder number	49	48	39	36	32

For the next disk operation, enter the head travel distance (in cylinders) between the current and next operation.

Answer:

The correct answer is: 1

**Question 9**

Correct

Mark 3.00 out of 3.00

When opening a file, we specify the opening mode and the sharing mode.

Let's encode the opening codes:

fmOpenRead	10
fmOpenWrite	01
fmOpenReadWrite	00
fmShareDenyWrite	10
fmShareExclusive	00
fmShareDenyRead	01
fmShareDenyNone	11

The first program opened the file in mode 01 and sharing mode 11

The second program wants to open the file in mode 00 and sharing mode 01

Will the second program be able to open the file (0-no, 1-yes, 2-it depends on other circumstances)?

Answer:

The correct answer is: 1

**Question 10**

Incorrect

Mark 0.00 out of 3.00

page	M	R	belongs to process
1	0	0	2
2	1	0	5
3	0	1	4
4	1	1	3
5	0	0	5
6	0	0	4
7	1	0	5
8	0	1	5

Using the above table of bits M and R for the pages in NRU swapping, with the priority frame allocation rule, which page will be sent to the disk first? The pages are scanned starting from the top. A process number is its priority (the smaller number, the higher priority). The process for which the frame is needed is 5. Provide a page number.

Answer:

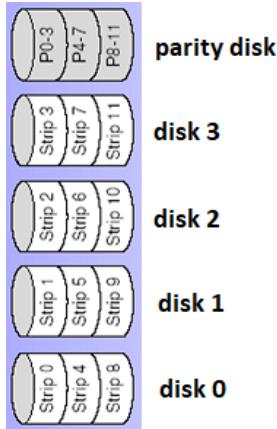
The correct answer is: 5

**Question 11**

Correct

Mark 3.00 out of 3.00

In RAID 4, data is placed in Strips that are "scattered" over the data disks, so that each subsequent strip is on the next data disk, modulo the number of disks. For this, there is a parity disk that holds the parity bits of zeroth bits, first bits, second bits, etc., equal-numbered strips divided by the number of data disks, for example, strips 0-3, 4-7, 8-11, etc.:



the start of strips 0,1,2,3 looks like this:

1	1	1	0	0	Parity disk
1	1	1	1	1	Disk 3
1	0	0	1	0	Disk 2
1	1	0	0	1	Disk 1
0	1	1	0	0	Disk 0

In the parity strip, the values are placed so that the parity bit keeps the corresponding strip bits 0-3 even.

Disk 3 has been corrupted and always reads 1. After replacing the disk with a new one, what values should I put in the strip on disk 3?

Enter the values of the consecutive bits on disk 3, without any separators between them, for example 00000

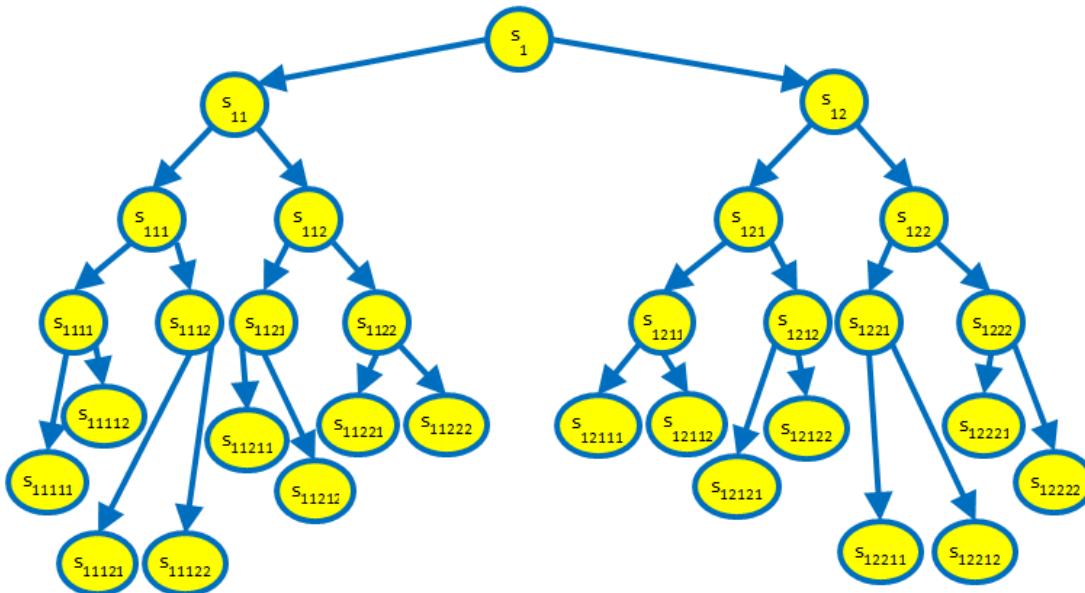
Answer:  ✓

The correct answer is: 11011

Question 12

Correct

Mark 3.00 out of 3.00



Above is the nesting structure of subroutines in some program.

Can there be a static link in subroutine s1111 stack frame to subroutine s1111 frame ?

answer: 0-no, 1-yes

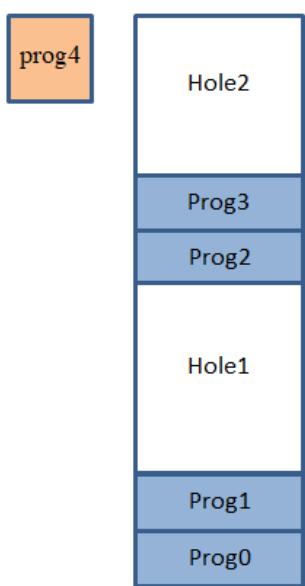
Answer:  ✓

The correct answer is: 0

Question 13

Correct

Mark 3.00 out of 3.00



In the above memory allocation state, 4 programs are already in memory, and 5th program is waiting to be loaded into the memory. The borders of the holes are:

- A - 2K
- B - 7K
- C - 12K
- D - 19K

The memory is allocated to the programs in the worst-fit rule, without making a new hole if the allocated block is larger than the demand.

What will be the internal fragmentation after loading the program Prog4 of size 2K into memory?

Answer:  ✓

===== for teacher =====

5 7

The correct answer is: 5

**Question 14**

Correct

Mark 3.00 out of 3.00

The virtual address consists of 7b page number and 9b offset. The page index table is shown below (index, content). For decimal address 672, binary 0000 0010 1010 0000, enter the physical address in the form: frame number.offset (as decimal numbers, offset to 3 digits). For example, for a physical address consisting of frame 0 and offset 18, specify 0.018. If there is no physical address for the given virtual address, then -1 should be specified.

7	4
6	5
5	-1
4	11
3	6
2	9
1	-1
0	1

Answer: 

The correct answer is: -1.000

**Question 15**

Correct

Mark 3.00 out of 3.00

What is the average time in the system for tasks in the batch, using SJF algorithm?

task	1	2	3	4
processing time	3.4	5.3	2.3	1.1

Answer: 

The correct answer is: 5.8

**Question 16**

Incorrect

Mark 0.00 out of 3.00

The stack is full descending, that is, the stack pointer points to the most recently put element on the stack, and the stack expands towards lower addresses. Memory is byte-organized (individual bytes are addressed). Every piece of data occupies 2 bytes (also, memory cells and general-purpose registers). Parameters are pushed on the stack by C convention, starting with the last one. The static link is pushed on the stack after the parameters. The subroutine has local variables: 4, which occupy 1 memory cell each. After calling the subroutine with parameters: 2, occupying 1 memory cell each, the static link will be at the address relative to the SP (decimal number should be entered):

Answer: 

The correct answer is: 12

**Question 17**

Correct

Mark 3.00 out of 3.00

page	history of R
0	001001
1	001110
2	000011
3	000111
4	011011
5	011100
6	010011
7	010111

Using the above table of the history of R bit for the pages in LRU swapping, which page will be sent to the disk first? The oldest bit R is on the left. Provide a page number.

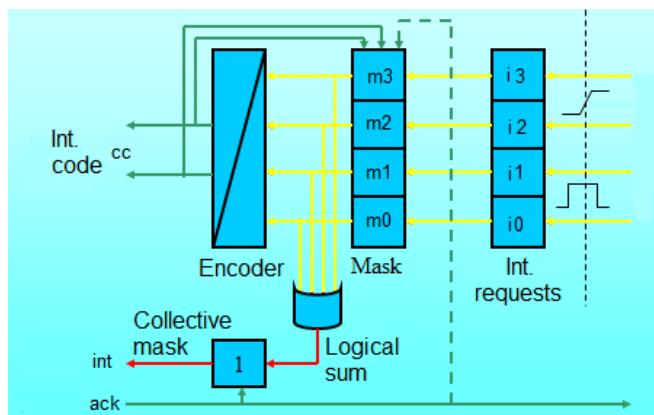
Answer:  ✓

The correct answer is: 2

**Question 18**

Correct

Mark 3.00 out of 3.00



In the given interrupt controller structure, the interrupt mask is 1100 (from m3 to m0). Enter the interrupt number from 0 to 3, without the prefix "i", that caused this mask form.

The interrupt with index 3 has the highest priority.

If no interrupt could cause this mask form, enter -1.

Answer:  ✓

The correct answer is: 1

<b>It has started</b>	Monday, June 16, 2025, 10:39 AM
<b>Condition</b>	Completed
<b>Completed</b>	Monday, June 16, 2025, 11:52 AM
<b>Time used</b>	1 hour 13 minutes
<b>Points</b>	40.00/40.00
<b>Rate</b>	25.00 points out of 25.00 possible points ( 100 %)

**Question 1**

Correctly

Points: 1.00 out of 1.00

Discontinuous allocation is the result of:

Select all correct:

- a. relocation
- b. compaction
- c. segmentation ✓
- d. paging ✓

Your answer is correct.

The correct answers are: paging, segmantation

**Question 2**

Correctly

Points: 1.00 out of 1.00

Interrupt vector:

Select all correct:

- a. and. contains the ID of the process that should be restarted
- b. contains minimal information that cannot be saved programmatically ✓
- c. contains the instruction counter, condition bits, interrupt mask, and general purpose registers
- d. it is saved automatically when an interrupt is accepted ✓

Your answer is correct.

The correct answers are: it is saved automatically when an interrupt is accepted, contains minimal information that cannot be saved programmatically

**Pytanie 3**

Poprawnie

Punkty: 1,00 z 1,00

WORST-FIT algorithm:

Wybierz wszystkie poprawne:

- a. It allows for fast determining whether there is a free block of the required size ✓
- b. It is designed to reduce external fragmentation ✓
- c. Requires a descending sort of the list of free blocks ✓
- d. Requires sorting the cut part into the list of free blocks ✓

Twoja odpowiedź jest poprawna.

Prawidłowymi odpowiedziami są: Requires a descending sort of the list of free blocks, It allows for fast determining whether there is a free block of the required size, It is designed to reduce external fragmentation, Requires sorting the cut part into the list of free blocks

**Pytanie 4**

Poprawnie

Punkty: 1,00 z 1,00

Which of the following memory allocation schemes causes external fragmentation?

- a. Multiple contiguous fixed partitions of various sizes ✓
- b. Multiple contiguous fixed partitions of equal size
- c. Paging
- d. Sweeping ✓

Prawidłowymi odpowiedziami są: Sweeping, Multiple contiguous fixed partitions of various sizes

**Pytanie 5**

Poprawnie

Punkty: 1,00 z 1,00

What is true about system level threads?

- a. Thread switching does not require interaction with the operating system.
- b. All threads of the process execute physically simultaneously.
- c. All process threads share the same address space. ✓
- d. All process threads can share the same set of open files. ✓

Prawidłowymi odpowiedziami są: All process threads can share the same set of open files., All process threads share the same address space.

**Pytanie 6**

Poprawnie

Punkty: 1,00 z 1,00

For concurrency in OS:

- a. cache memory is necessary
- b. timer interrupts are necessary
- c. special processor support is required
- d. interrupt handling is necessary ✓

Poprawna odpowiedź to: interrupt handling is necessary

**Pytanie 7**

Poprawnie

Punkty: 1,00 z 1,00

The interrupt acceptance sequence consists of (in the sequence):

Wybierz wszystkie poprawne:

- a. identification of the interrupt level, saving the interrupt vector, performing a jump according to the interrupt table
- b. identification of the interrupt level, performing a jump according to the interrupt table, saving the interrupt vector
- c. identification of the interrupt level, saving the interrupt vector, performing a jump with a trace according to the interrupt table ✓
- d. identification of the interrupt level, performing a jump with the trace according to the interrupt table, saving the interrupt vector

Twoja odpowiedź jest poprawna.

Poprawna odpowiedź to: identification of the interrupt level, saving the interrupt vector, performing a jump with a trace according to the interrupt table

**Pytanie 8**

Poprawnie

Punkty: 3,00 z 3,00

For the disk operation scheduling Cyclic SCAN method, the currently being executed operation is in 30 cylinder. The direction in the Cyclic SCAN method is ascending. The next scheduled operations (in the order of their queuing) are:

Operation number	1	2	3	4	5
Cylinder number	41	24	25	34	40

For the next disk operation, enter the head travel distance (in cylinders) between the current and next operation.

Odpowiedź:  ✓

Poprawna odpowiedź to: 4

**Pytanie 9**

Poprawnie

Punkty: 3,00 z 3,00

When opening a file, we specify the opening mode and the sharing mode.

Let's encode the opening codes:

fmOpenRead	10
fmOpenWrite	01
fmOpenReadWrite	00
fmShareDenyWrite	10
fmShareExclusive	00
fmShareDenyRead	01
fmShareDenyNone	11

The first program opened the file in mode 01 and sharing mode 11

The second program wants to open the file in mode 00 and sharing mode 00

Will the second program be able to open the file (0-no, 1-yes, 2-it depends on other circumstances)?

Odpowiedź:  ✓

Poprawna odpowiedź to: 0

**Pytanie 10**

Poprawnie

Punkty: 3,00 z 3,00

page	M	R	belongs to process
1	0	1	3
2	1	1	3
3	0	0	4
4	1	0	6
5	0	1	2
6	0	1	5
7	1	1	5
8	0	0	5

Using the above table of the history of R bit for the pages in NRU swapping, with global frame allocation rule, which page will be sent to the disk first? The pages are scanned starting from the top. The process for which the frame is needed is 2. Provide a page number.

Odpowiedź: 3 ✓

Poprawna odpowiedź to: 3

**Pytanie 11**

Poprawnie

Punkty: 3,00 z 3,00

In RAID 4, data is placed in Strips that are "scattered" over the data disks, so that each subsequent strip is on the next data disk, modulo the number of disks. For this, there is a parity disk that holds the parity bits of zeroth bits, first bits, second bits, etc., equal-numbered strips divided by the number of data disks, for example, strips 0-3, 4-7, 8-11, etc.:



the start of strips 0,1,2,3 looks like this:

1	1	1	0	0	Parity disk
1	1	1	1	1	Disk 3
1	0	0	1	0	Disk 2
1	0	1	0	1	Disk 1
0	1	1	0	0	Disk 0

In the parity strip, the values are placed so that the parity bit keeps the corresponding strip bits 0-3 even.

Disk 3 has been corrupted and always reads 1. After replacing the disk with a new one, what values should I put in the strip on disk 3?

Enter the values of the consecutive bits on disk 3, without any separators between them, for example 00000

Odpowiedź:  ✓

Poprawna odpowiedź to: 10111

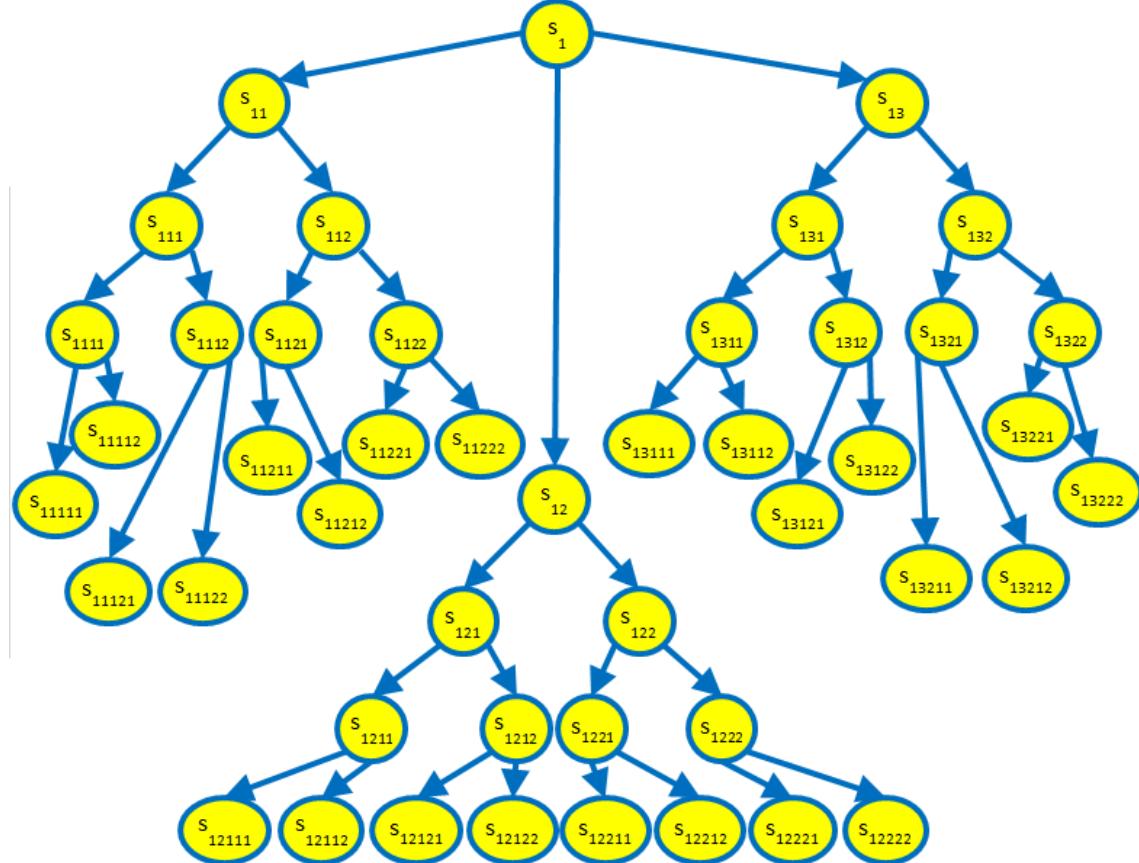
Pytanie 12

Poprawnie

Punkty: 3,00 z 3,00

The stack frame of which subroutine (specify the index) will be pointed by the static link in the frame of the subroutine S1222, that is called from the subroutine S12?

If the call is not possible, enter index -1.



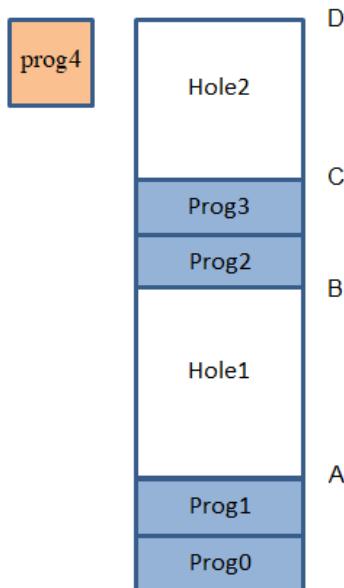
Odpowiedź:  ✓

Poprawna odpowiedź: -1

**Pytanie 13**

Poprawnie

Punkty: 3,00 z 3,00



In the above memory allocation state, 4 programs are already in memory, and 5th program is waiting to be loaded into the memory. The borders of the holes are:

- A - 4K
- B - 6K
- C - 15K
- D - 17K

The memory is allocated to the programs in the worst-fit rule, without making a new hole if the allocated block is larger than the demand.

What will be the internal fragmentation after loading the program Prog4 of size 2K into memory?

Odpowiedź:

===== for teacher =====

22

Poprawna odpowiedź to: 0

**Pytanie 14**

Poprawnie

Punkty: 3,00 z 3,00

Assuming that memory cells are 1-byte, the page number in the address field is 13 bits, the offset is 13 bits, the frame number is 11 bits, and all entries in the TIS page index table are on a 4-byte word boundary, please specify:

- the maximum size of the physical memory in MB

Odpowiedź:

Poprawna odpowiedź to: 16

**Pytanie 15**

Poprawnie

Punkty: 3,00 z 3,00

We have the tasks with the following priorities in the access to a resource (a larger number is a higher priority):

Process number	1	2	3	4	5	6
Priority	45	44	39	38	42	31

The scheduling policy is preemptive, with the decision time constraint based on time slicing.

The current process is number 4. What process will get the resource in the nearest decision? Provide its priority.

Odpowiedź:  ✓

Poprawna odpowiedź to: 45

**Pytanie 16**

Poprawnie

Punkty: 3,00 z 3,00

The organization of memory and processor is word-based. A word means 16 bits. (int also takes 1 word) Hexadecimal values are preceded by a # character.

variable a has the value #a0c0

variable b has the value #a0a0

variable c has the value #a0a5

top of the stack (full descending, i.e. the stack pointer points to the most recently put element on the stack, and the stack expands towards lower addresses): #c100

address of subroutine A #1010

stack frame before calling subroutine A #c105

Calling rules: Parameters are put on the stack in accordance with the convention of the C language, i.e. starting from the last one, without a static link, the result of the function is passed in registers. The contents of the stack at label point C. Subroutine A is called A(c,b,a); from address #10a0.

regardless of the programming language, the subroutine header A has the form

A(int x,y,z);

{

    int p = z-y;

    int q = x-y;

C: ...

}

The content of the cell at address #c0fb: dynamic link



Address	content
#c100	????
#c0ff	#a0a5
#c0fe	#a0a0
#c0fd	#a0c0
#c0fc	#10a1
#c0fb	#c105
#c0fa	#0005
#c0f9	#0020
#c0f8	????

Twoja odpowiedź jest poprawna.

Poprawna odpowiedź to:

The organization of memory and processor is word-based. A word means 16 bits. (int also takes 1 word) Hexadecimal values are preceded by a # character.

variable a has the value #a0c0

variable b has the value #a0a0

variable c has the value #a0a5

top of the stack (full descending, i.e. the stack pointer points to the most recently put element on the stack, and the stack expands towards lower addresses): #c100

address of subroutine A #1010

stack frame before calling subroutine A #c105

Calling rules: Parameters are put on the stack in accordance with the convention of the C language, i.e. starting from the last one, without a static link, the result of the function is passed in registers. The contents of the stack at label point C. Subroutine A is called A(c,b,a); from address #10a0.

regardless of the programming language, the subroutine header A has the form

A(int x,y,z);

{

    int p = z-y;

    int q = x-y;

C: ...

}

The content of the cell at address #c0fb:[dynamic link]

Address	content
#c100	????
#c0ff	#a0a5
#c0fe	#a0a0
#c0fd	#a0c0
#c0fc	#10a1
#c0fb	#c105
#c0fa	#0005
#c0f9	#0020
#c0f8	????

**Pytanie 17**

Poprawnie

Punkty: 3,00 z 3,00

page	history of R
0	011000
1	011100
2	010001
3	010110
4	001011
5	001100
6	000011
7	000100

Using the above table of the history of R bit for the pages in LRU swapping, which page will be sent to the disk first? The oldest bit R is on the left. Provide a page number.

Odpowiedź:

6

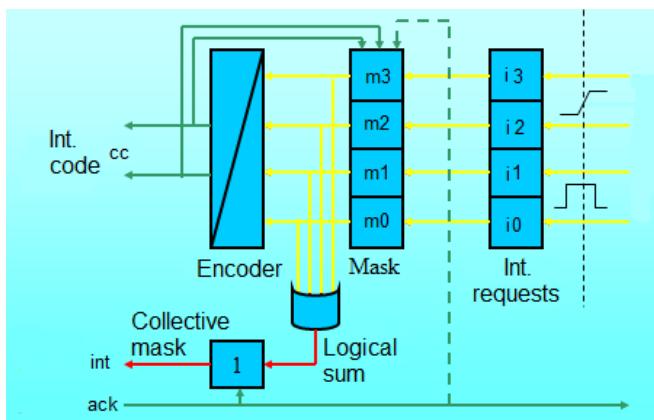


Poprawna odpowiedź to: 6

**Pytanie 18**

Poprawnie

Punkty: 3,00 z 3,00



In the given interrupt controller structure, the interrupt mask is 1110 (from m3 to m0), and interrupts 0011 (from i3 to i0) are reported.

The interrupt with index 3 has the highest priority.

What will be the value of the interrupt code cc sent to the processor (provide the code in decimal)?

If no interrupt is reported, enter -1

Odpowiedź:  ✓

Poprawna odpowiedź to: 1

<b>Started on</b>	Monday, 16 June 2025, 10:20 AM
<b>State</b>	Finished
<b>Completed on</b>	Monday, 16 June 2025, 11:40 AM
<b>Time taken</b>	1 hour 19 mins
<b>Marks</b>	26.00/40.00
<b>Grade</b>	16.25 out of 25.00 (65%)

**Question 1**

Correct

Mark 1.00 out of 1.00

Interrupt request register is:

Select one or more:

- a. a register where interrupt line states are stored ✓
- b. a register that blocks or unblocks individual interrupts
- c. a register that blocks or unblocks all interrupts
- d. a combinational circuit that calculates the number of the interrupt received

Twoja odpowiedź jest poprawna.

The correct answer is: a register where interrupt line states are stored

**Question 2**

Incorrect

Mark 0.00 out of 1.00

Context switch is caused by:

Select one or more:

- a. input/output operations ✗
- b. relocation
- c. interrupts ✓
- d. paging

Twoja odpowiedź jest niepoprawna.

The correct answer is: interrupts



**Question 3**

Correct

Mark 1.00 out of 1.00

In a concurrent environment, the operating system decides which task the CPU gets, when, and for how long. This feature is called:

- a. task timetable planning
- b. task management
- c. task scheduling ✓
- d. traffic management

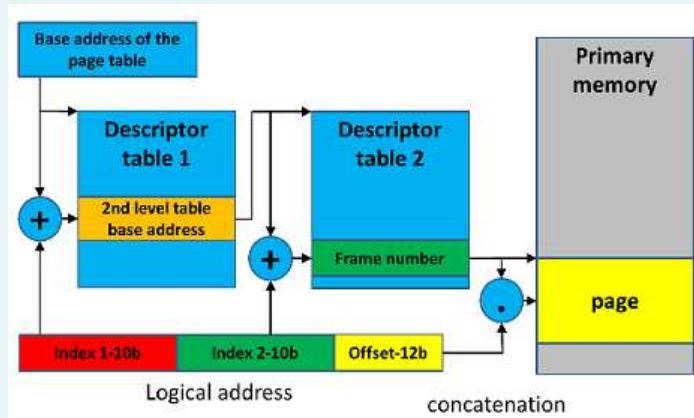
The correct answer is: task scheduling

**Question 4**

Incorrect

Mark 0.00 out of 1.00

Two-level TIS - place frame no:



Select one or more:

- a. in the table of the first level - on the left in the figure
- b. part in the first level table and part in the second level table
- c. none of the above answers
- d. in the table of the second level - on the right in the figure ✗

Twoja odpowiedź jest niepoprawna.

The correct answer is:

none of the above answers



**Question 5**

Correct

Mark 1.00 out of 1.00

Paging is in thrashing if:

- a. page cannot be swapped
- b. the system spends less time paging than execution
- c. the system spends more time paging than execution ✓
- d. page faults occur

The correct answer is: the system spends more time paging than execution

**Question 6**

Correct

Mark 1.00 out of 1.00

What does the file system layer do?

- a. Manages remote file systems
- b. Manages relationships between files
- c. Manages directories ✓
- d. Manages remote files
- e. Manages free storage space ✓

The correct answers are: Manages directories, Manages free storage space

**Question 7**

Correct

Mark 1.00 out of 1.00

For concurrency in OS:

- a. interrupt handling is necessary ✓
- b. timer interrupts are necessary
- c. special processor support is required
- d. cache memory is necessary

The correct answer is: interrupt handling is necessary



**Question 8**

Correct

Mark 3.00 out of 3.00

For the disk operation scheduling SCAN method, the currently being executed operation is in 40 cylinder. The direction in the SCAN method is ascending. The next scheduled operations (in the order of their queuing) are:

Operation number	1	2	3	4	5
Cylinder number	51	32	39	44	48

After which disk operation the current scan direction will change? Provide the cylinder number of the operation after which the direction will change.

Answer:  

The correct answer is: 51

**Question 9**

Correct

Mark 3.00 out of 3.00

When opening a file, we specify the opening mode and the sharing mode.

Let's encode the opening codes:

fmOpenRead	10
fmOpenWrite	01
fmOpenReadWrite	00
fmShareDenyWrite	10
fmShareExclusive	00
fmShareDenyRead	01
fmShareDenyNone	11



The first program opened the file in mode 10 and sharing mode 10

The second program wants to open the file in mode 00 and sharing mode 00

Will the second program be able to open the file (0-no, 1-yes, 2-it depends on other circumstances)?

Answer:  

The correct answer is: 0

**Question 10**

Incorrect

Mark 0.00 out of 3.00

page	Last used	Bit R	belongs to process
1	89	1	4
2	90	0	4
3	91	0	2
4	92	0	3
5	93	1	2
6	94	1	3
7	95	0	2
8	96	1	4

Using the above table of the history of R bit for the pages in Workset swapping algorithm, with priority frame allocation method, which page will be sent to the disk first? The current time slice number is 97, and the time range  $\tau$  for the workset is 5 (the threshold  $97-\tau=92$ ). Page scan starts from the top. The current process that needs a page to be loaded is 4. A process number is its priority (the smaller number, the higher priority). Provide a page number to be sent to the disk.

Answer:  

The correct answer is: 2

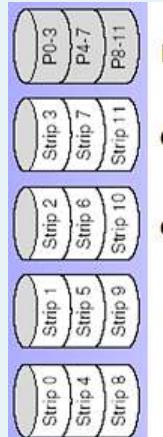


**Question 11**

Incorrect

Mark 0.00 out of 3.00

In RAID 4, data is placed in Strips that are "scattered" over the data disks, so that each subsequent strip is on the next data disk, modulo the number of disks. For this, there is a parity disk that holds the parity bits of zeroth bits, first bits, second bits, etc., equal-numbered strips divided by the number of data disks, for example, strips 0-3, 4-7, 8-11, etc.:

**parity disk****disk 3****disk 2****disk 1****disk 0**

the start of strips 0,1,2,3 looks like this:

1	1	1	0	0	Parity disk
0	0	0	0	0	Disk 3
1	0	0	1	0	Disk 2
1	0	1	0	1	Disk 1
0	1	1	0	0	Disk 0

In the parity strip, the values are placed so that the parity bit keeps the corresponding strip bits 0-3 even.

Disk 3 has been damaged and reads only 0. After replacing the disk with a new one, what values should be put in the strip on disk 3?

Enter the values of the consecutive bits on disk 3, without any separators between them, for example 00000

Answer:  ×

The correct answer is: 10111

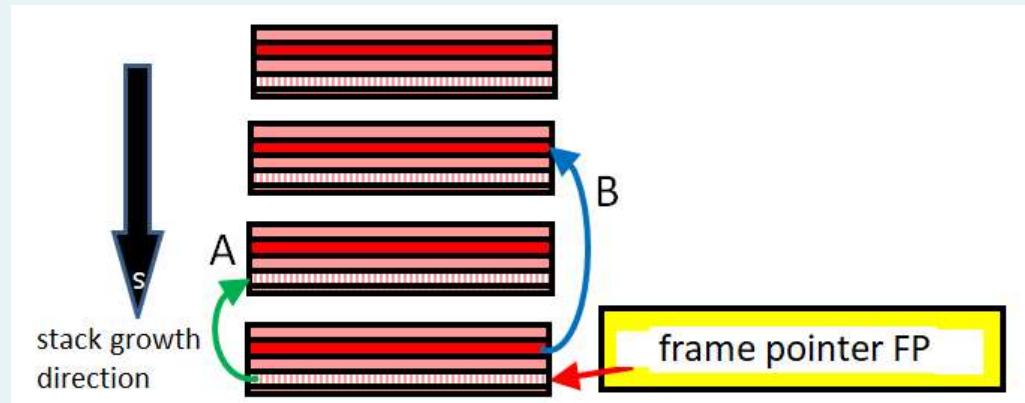


**Question 12**

Correct

Mark 3.00 out of 3.00

In the shown "snapshot" of the program stack, the static link (A) and the dynamic link (B) are shown. The subroutine pointed by B is the "parent" of the subroutine at the top of the stack in the hierarchy. Could the subroutine on top of the stack be called recursively?

 True ✓ False

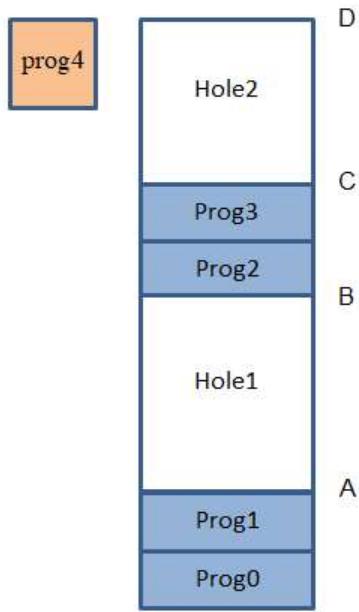
The correct answer is 'True'.



**Question 13**

Incorrect

Mark 0.00 out of 3.00



In the above memory allocation state, 4 programs are already in memory, and 5th program is waiting to be loaded into the memory. The borders of the holes are:

- A - 2K
- B - 6K
- C - 12K
- D - 17K

The memory is allocated to the programs in the worst-fit rule, without making a new hole if the allocated block is larger than the demand.

What will be the internal fragmentation after loading the program Prog4 of size 1K into memory?

Answer:  ×

===== for teacher =====

4 5

The correct answer is: 4



**Question 14**

Correct

Mark 3.00 out of 3.00

Assuming that the instruction is 32 bits, the data accessed in the instructions are 2, 4 or 8 bytes, the memory access addressing is on the word (2-byte) boundary, and the page size is 4kB, one instruction can cause the following number of exceptions "page fault":

Answer: 4



The correct answer is: 4

**Question 15**

Correct

Mark 3.00 out of 3.00

What is the average time in the system for tasks in the batch incoming in this order, using FCFS algorithm?

The system is equipped with 4 processors

task	1	2	3	4
processing time	3.6	4.6	2.4	1.2

Answer: 2.95



The correct answer is: 2.9



**Question 16**

Correct

Mark 3.00 out of 3.00

The organization of memory and processor is word-based. A word means 16 bits (int also takes 1 16-bit word). Hexadecimal values are preceded by a # character.

variable a has the value #a0c0

top of the stack (full descending, i.e. the stack pointer points to the most recently put element on the stack, and the stack expands towards lower addresses) #c100

stack frame before subroutine B call #c1010

address of subroutine B #1021

Calling rules: Parameters are put on the stack in accordance with the convention of the C language, i.e. starting from the last one, without a static connection, the result of the function is passed in registers. The stack is shown after subroutine B is called by itself (recursively), at label point C. Subroutine B is called for the first time B(a-2); somewhere in the program from address #1011. Label C has address #1050.

regardless of the programming language, subroutine B has the form

B(int i);

{

    int p=i+1;

    C:     B(i-3);

}

The content of the cell at address #c0f9:  

Address	content
#c100	????
#c0ff	#a0be
#c0fe	#1012
#c0fd	#c010
#c0fc	#a0bf
#c0fb	#a0bb
#c0fa	#1051
#c0f9	#c0fd
#c0f8	#a0bc
#c0f7	????
#c0f6	????



Twoja odpowiedź jest poprawna.

The correct answer is:

The organization of memory and processor is word-based. A word means 16 bits (int also takes 1 16-bit word). Hexadecimal values are preceded by a # character.

variable a has the value #a0c0

top of the stack (full descending, i.e. the stack pointer points to the most recently put element on the stack, and the stack expands towards lower addresses) #c100

stack frame before subroutine B call #c1010

address of subroutine B #1021

Calling rules: Parameters are put on the stack in accordance with the convention of the C language, i.e. starting from the last one, without a static connection, the result of the function is passed in registers. The stack is shown after subroutine B is called by itself (recursively), at label point C. Subroutine B is called for the first time B(a-2); somewhere in the program from address #1011. Label C has address #1050.

regardless of the programming language, subroutine B has the form

```
B(int i);
{
    int p=i+1;
    C:    B(i-3);
}
```

The content of the cell at address #c0f9:[dynamic link]

Address	content
#c100	????
#c0ff	#a0be
#c0fe	#1012
#c0fd	#c010
#c0fc	#a0bf
#c0fb	#a0bb
#c0fa	#1051
#c0f9	#c0fd
#c0f8	#a0bc
#c0f7	????
#c0f6	????

### Question 17

Incorrect

Mark 0.00 out of 3.00

page nr	1	2	3	4	5	6	7	8	9
loaded	2	7	15	23	25	35	53	60	62
R bit	0	1	0	1	1	1	1	1	0

Using the above list for the FIFO-second chance swapping algorithm, which page will be sent to the disk first? The middle row is the number of a time slice in which a page was loaded to a frame. Provide a page number.

Answer:  ×

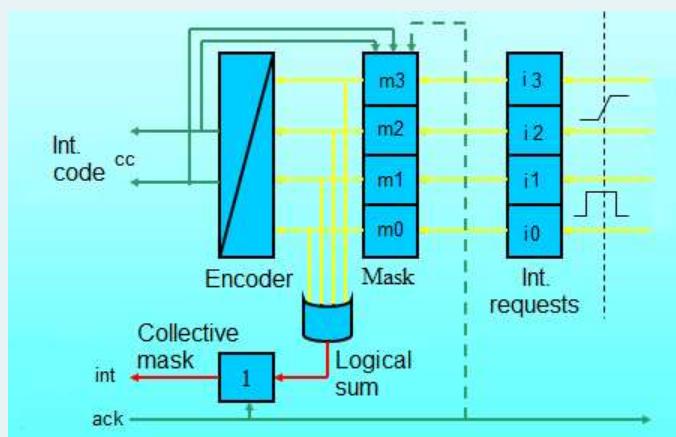


The correct answer is: 1

**Question 18**

Correct

Mark 3.00 out of 3.00



In the given interrupt controller structure, the interrupt mask is 1100 (from m3 to m0), and interrupts 0011 (from i3 to i0) are reported.

The interrupt with index 3 has the highest priority.

What will be the value of the interrupt code cc sent to the processor (provide the code in decimal)?

If no interrupt is reported, enter -1

Answer:

The correct answer is: -1



<b>Started on</b>	Monday, 16 June 2025, 10:52 AM
<b>State</b>	Finished
<b>Completed on</b>	Monday, 16 June 2025, 11:46 AM
<b>Time taken</b>	54 mins 7 secs
<b>Marks</b>	36.00/40.00
<b>Grade</b>	22.50 out of 25.00 (90%)

**Question 1**

Correct

Mark 1.00 out of 1.00

For concurrency in OS:

- a. interrupt handling is necessary ✓
- b. special processor support is required
- c. timer interrupts are necessary
- d. cache memory is necessary

The correct answer is: interrupt handling is necessary

**Question 2**

Incorrect

Mark 0.00 out of 1.00

The following paging exceptions allow for returning to the program after they occur:

Select one or more:

- a. page fault ✓
- b. attempting to write to a write-protected frame
- c. interrupt on write (IOW) ✓
- d. attempt to read from the frame storing the code ✗

Twoja odpowiedź jest niepoprawna.

The correct answers are: page fault, interrupt on write (IOW)

**Question 3**

Correct

Mark 1.00 out of 1.00

The return from interrupt instruction:

Select one or more:

- a. causes the processor to switch to a process other than the interrupted one
- b. restores the program counter ✓
- c. restores the process stack
- d. restores the conditions register ✓

Twoja odpowiedź jest poprawna.

The correct answers are: restores the program counter, restores the conditions register

**Question 4**

Correct

Mark 1.00 out of 1.00

What mechanism is used to save and restore the task state?

- a. task descriptor
- b. scheduling data
- c. applications counter
- d. context switch ✓

The correct answer is: context switch

**Question 5**

Correct

Mark 1.00 out of 1.00

Imprecise interrupts can be handled:

Select one or more:

- a. only when the program allows accepting interrupts
- b. when new instructions are suspended to be fetched into the pipeline
- c. after saving the full state of the pipeline ✓
- d. after clearing the pipeline from the instructions ✓

Twoja odpowiedź jest poprawna.

The correct answers are: after clearing the pipeline from the instructions, after saving the full state of the pipeline

**Question 6**

Correct

Mark 1.00 out of 1.00

Inter-process communication can be organized using:

Select one or more:

- a. interrupts
- b. shared memory fields accessible through system calls ✓
- c. messages ✓
- d. shared directly addressable memory fields ✓

Twoja odpowiedź jest poprawna.

The correct answers are: messages, shared directly addressable memory fields, shared memory fields accessible through system calls

**Question 7**

Correct

Mark 1.00 out of 1.00

A concurrent system is one that, in principle:

Select one or more:

- a. It runs on a multiprocessor computer
- b. Requires the use of timer interrupts
- c. It allows multiple programs/processes/threads to run physically simultaneously
- d. Allows multiple programs/processes/threads to run simultaneously or seemingly simultaneously



Twoja odpowiedź jest poprawna.

The correct answer is: Allows multiple programs/processes/threads to run simultaneously or seemingly simultaneously

**Question 8**

Correct

Mark 3.00 out of 3.00

For the disk operation scheduling SCAN method, the currently being executed operation is in 33 cylinder.

The direction in the SCAN method is ascending. The next scheduled operations (in the order of their queuing) are:

Operation number	1	2	3	4	5
Cylinder number	42	25	28	37	41

After which disk operation the current scan direction will change? Provide the cylinder number of the operation after which the direction will change.

Answer: 42



The correct answer is: 42

**Question 9**

Correct

Mark 3.00 out of 3.00

When opening a file, we specify the opening mode and the sharing mode.

Let us encode the opening codes:

fmOpenRead	10
fmOpenWrite	01
fmOpenReadWrite	00
fmShareDenyWrite	10
fmShareExclusive	00
fmShareDenyRead	01
fmShareDenyNone	11

The first program opened the file in mode 00 and sharing mode 10

The second program wants to open the file in mode 01 and sharing mode 11

Will the second program be able to open the file (0-no, 1-yes, 2-it depends on other circumstances)?

Answer:

 0

The correct answer is: 0

**Question 10**

Correct

Mark 3.00 out of 3.00

page	M	R	belongs to process
1	1	1	5
2	0	1	3
3	1	0	4
4	0	0	4
5	1	1	5
6	1	1	3
7	0	1	4
8	1	0	5

Using the above table of bits M and R for the pages in NRU swapping, with the priority frame allocation rule, which page will be sent to the disk first? The pages are scanned starting from the top. A process number is its priority (the smaller number, the higher priority). The process for which the frame is needed is 4. Provide a page number.

Answer: 4 ✓

The correct answer is: 4

**Question 11**

Correct

Mark 3.00 out of 3.00

In RAID 4, data is placed in Strips that are "scattered" over the data disks, so that each subsequent strip is on the next data disk, modulo the number of disks. For this, there is a parity disk that holds the parity bits of zeroth bits, first bits, second bits, etc., equal-numbered strips divided by the number of data disks, for example, strips 0-3, 4-7, 8-11, etc.:



the start of strips 0,1,2,3 looks like this:

0	1	0	0	1	Parity disk
0	0	0	0	0	Disk 3
1	0	1	1	0	Disk 2
1	1	0	0	1	Disk 1
0	1	1	0	0	Disk 0

In the parity strip, the values are placed so that the parity bit keeps the corresponding strip bits 0-3 odd.

Disk 3 has been damaged and reads only 0. After replacing the disk with a new one, what values should be put in the strip on disk 3?

Enter the values of the consecutive bits on disk 3, without any separators between them, for example  
00000

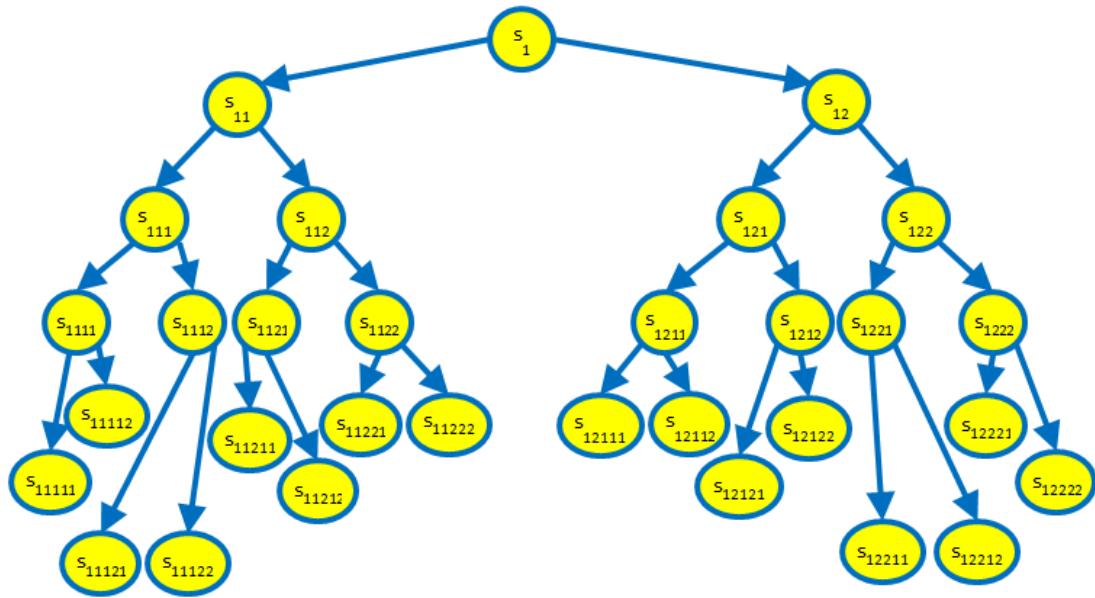
Answer:

The correct answer is: 10101

**Question 12**

Correct

Mark 3.00 out of 3.00



Above is the nesting structure of subroutines in some program.

Can there be a static link in subroutine s12 stack frame to subroutine s122 frame?

answer: 0-no, 1-yes

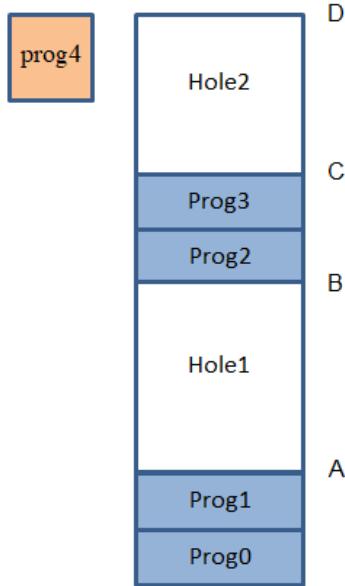
Answer:  ✓

The correct answer is: 0

**Question 13**

Correct

Mark 3.00 out of 3.00



In the above memory allocation state, 4 programs are already in memory, and 5th program is waiting to be loaded into the memory. The borders of the holes are:

- A - 2K
- B - 3K
- C - 12K
- D - 19K

The memory is allocated to the programs in the first-fit rule, without making a new hole if the allocated block is larger than the demand. The memory is scanned for the fitting hole starting from the lower addresses.

What will be the internal fragmentation after loading the program Prog4 of size 5K into memory?

Answer: 2 ✓

===== for teacher =====

1 7

The correct answer is: 2

**Question 14**

Correct

Mark 3.00 out of 3.00

The virtual address consists of 7b page number and 9b offset. The page index table is shown below (index, content). For decimal address 2704, binary 0000 1010 1001 0000, enter the physical address in the form: frame number.offset (as decimal numbers, offset to 3 digits). For example, for a physical address consisting of frame 0 and offset 18, specify 0.018. If there is no physical address for the given virtual address, then -1 should be specified.

7	4
6	5
5	-1
4	11
3	6
2	9
1	-1
0	1

Answer: -1 ✓

The correct answer is: -1.000

**Question 15**

Correct

Mark 3.00 out of 3.00

What is the average time in the system for tasks in the batch, using SJF algorithm?

The system is equipped with 4 processors

task	1	2	3	4
processing time	3.6	5.6	2.8	1.7

Answer: 3.425 ✓

The correct answer is: 3.4

**Question 16**

Incorrect

Mark 0.00 out of 3.00

The stack is full descending, that is, the stack pointer points to the most recently put element on the stack, and the stack expands towards lower addresses. Memory is byte-organized (individual bytes are addressed). Every piece of data occupies 4 bytes (also, memory cells and general-purpose registers).

Parameters are pushed on the stack by C convention, starting with the last one. The static link is pushed on the stack after the parameters. The subroutine has local variables: 4, which occupy 1 memory cell each.

After calling the subroutine with parameters: 3, occupying 1 memory cell each, the static link will be at the address relative to the SP (decimal number should be entered):

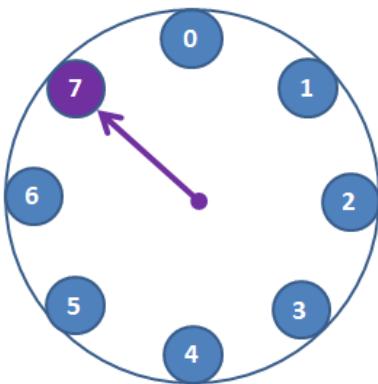
Answer: 28 ✖

The correct answer is: 24

**Question 17**

Correct

Mark 3.00 out of 3.00



page	3	4	5	6	7	0	1	2
R bit	1	1	1	1	1	1	1	1

Using the above list for the Clock swapping algorithm, which page will be sent to the disk first? Provide a page number.

The current position of the "arrow" is 3 (regardless of the position in the picture), and the algorithm works clockwise.

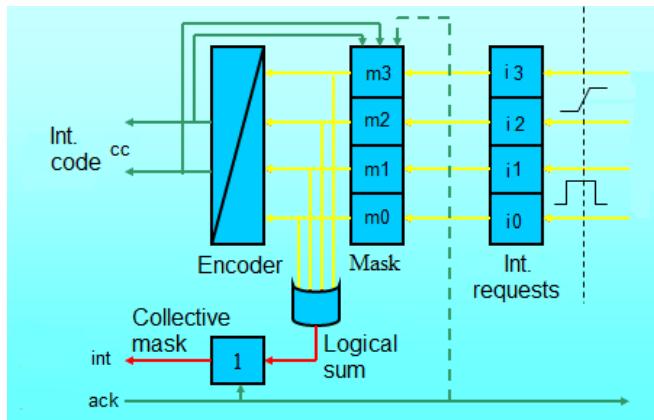
Answer: 3 ✓

The correct answer is: 3

**Question 18**

Correct

Mark 3.00 out of 3.00



In the given interrupt controller structure, the interrupt mask is 1111 (from m3 to m0), and interrupts 0010 (from i3 to i0) are reported.

The interrupt with index 3 has the highest priority.

What will be the new value of the interrupt mask? Provide the bits .m3m2m1m0 (mask preceded by a point) for example .0101

Answer:  ✓

The correct answer is: 0.1100

<b>It has started</b>	Monday, June 16, 2025, 10:23 AM
<b>Condition</b>	Completed
<b>Completed</b>	Monday, June 16, 2025, 11:41 AM
<b>Time used</b>	1 hour 17 minutes
<b>Points</b>	34.50/40.00
<b>Rate</b>	21.56 points out of 25.00 points possible to obtain ( 86.25 %)

**Question 1**

Correctly

Points: 1.00 out of 1.00

The following situations trigger "error" exceptions:

Select all correct:

- a. memory reference beyond limit register value ✓
- b. memory reference in the area of the page that is not in memory
- c. a reference to memory that is not in the program address space ✓
- d. an attempt to execute an instruction from the area of the page for which the "no code" bit was set ✓

Your answer is correct.

The correct answers are: a reference to memory that is not in the program address space, memory reference beyond limit register value, an attempt to execute an instruction from the area of the page for which the "no code" bit was set

**Question 2**

Correctly

Points: 1.00 out of 1.00

At the ready state is a process that:

Select all correct:

- a. waits for a processor ✓
- b. occupies a processor
- c. waits for an I/O operation to complete
- d. fills the processor idle time

Your answer is correct.

The correct answer is: waits for a processor

**Question 3**

Correctly

Points: 1.00 out of 1.00

Cloning a process with a *fork* operation results in (not taking to account the numerical result of *fork*):

Select all correct:

- a. Duplication of data segment and stack segment ✓
- b. Duplication of code segment, initialization of new data segment and stack segment
- c. Duplication of code, data and stack segments

Your answer is correct.

The correct answer is: Duplication of data segment and stack segment

**Question 4**

Incorrectly

Points: 0.00 out of 1.00

The virtualizer that takes over the guest application system call extracodes and transfers them to the host system for execution (adjusting the call parameters accordingly), it can be:

Select all correct:

- a. paravirtualizer
- b. full virtualizer
- c. emulator ✗
- d. API virtualizer ✓

Your answer is incorrect.

The correct answer is: API virtualizer

**Question 5**

Correctly

Points: 1.00 out of 1.00

What mechanism is used to save and restore the task state?

- a. task descriptor
- b. context switch ✓
- c. applications counter
- d. scheduling data

Poprawna odpowiedź to: context switch

**Pytanie 6**

Niepoprawnie

Punkty: 0,00 z 1,00

Nested page index tables require activity during:

references



Twoja odpowiedź jest niepoprawna.

Poprawna odpowiedź to:

Nested page index tables require activity during:

[swapping]

**Pytanie 7**

Częściowo poprawnie

Punkty: 0,50 z 1,00

Dynamic relocation is performed by:

- a. Compiler
- b. Linker
- c. Paging system
- d. Segment descriptors ✓

Prawidłowymi odpowiedziami są: Paging system, Segment descriptors

**Pytanie 8**

Poprawnie

Punkty: 3,00 z 3,00

For the disk operation scheduling SCAN method, the currently being executed operation is in 40 cylinder. The direction in the SCAN method is ascending. The next scheduled operations (in the order of their queuing) are:

Operation number	1	2	3	4	5
Cylinder number	51	32	39	44	48

For the next disk operation, enter the head travel distance (in cylinders) between the current and next operation.

Odpowiedź: 4 ✓

Poprawna odpowiedź to: 4

**Pytanie 9**

Poprawnie

Punkty: 3,00 z 3,00

When opening a file, we specify the opening mode and the sharing mode.

Let's encode the opening codes:

fmOpenRead	10
fmOpenWrite	01
fmOpenReadWrite	00
fmShareDenyWrite	10
fmShareExclusive	00
fmShareDenyRead	01
fmShareDenyNone	11

The first program opened the file in mode 01 and sharing mode 00

The second program wants to open the file in mode 01 and sharing mode 01

Will the second program be able to open the file (0-no, 1-yes, 2-it depends on other circumstances)?

Odpowiedź:

Poprawna odpowiedź to: 0

**Pytanie 10**

Poprawnie

Punkty: 3,00 z 3,00

page	Last used	Bit R	belongs to process
1	91	0	3
2	92	1	5
3	89	1	4
4	90	1	5
5	95	0	5
6	96	0	4
7	93	1	4
8	94	0	4

Using the above table of the history of R bit for the pages in Workset swapping algorithm, with local frame allocation method, which page will be sent to the disk first? The current time slice number is 97, and the time range  $\tau$  for the workset is 3 (the threshold  $97-\tau=94$ ). Page scan starts from the top. The current process that needs a page to be loaded is 3. A process number is its priority (the smaller number, the higher priority). Provide a page number to be sent to the disk.

Odpowiedź:

Poprawna odpowiedź to: 1

**Pytanie 11**

Poprawnie

Punkty: 3,00 z 3,00

In RAID 4, data is placed in Strips that are "scattered" over the data disks, so that each subsequent strip is on the next data disk, modulo the number of disks. For this, there is a parity disk that holds the parity bits of zeroth bits, first bits, second bits, etc., equal-numbered strips divided by the number of data disks, for example, strips 0-3, 4-7, 8-11, etc.:



the start of strips 0,1,2,3 looks like this:

1	1	1	0	0	Parity disk
1	1	1	1	1	Disk 3
1	0	0	1	0	Disk 2
1	0	1	0	1	Disk 1
0	1	1	0	0	Disk 0

In the parity strip, the values are placed so that the parity bit keeps the corresponding strip bits 0-3 even.

Disk 3 has been corrupted and always reads 1. After replacing the disk with a new one, what values should I put in the strip on disk 3?

Enter the values of the consecutive bits on disk 3, without any separators between them, for example 00000

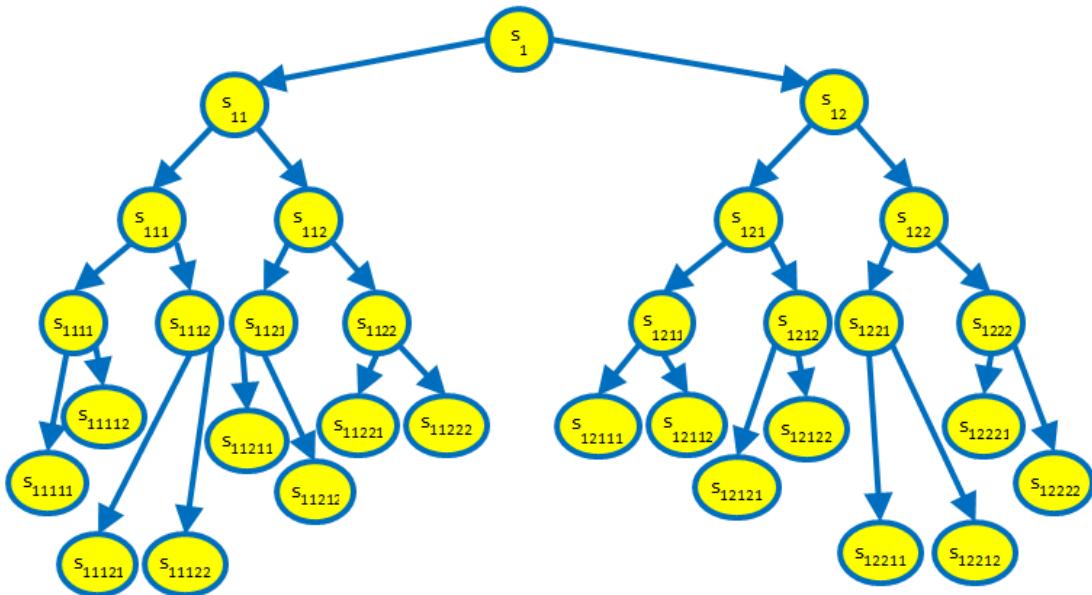
Odpowiedź:  ✓

Poprawna odpowiedź to: 10111

**Pytanie 12**

Poprawnie

Punkty: 3,00 z 3,00



Above is the nesting structure of subroutines in some program.

Can there be a static link in subroutine s121 stack frame to subroutine s12 frame?

answer: 0-no, 1-yes

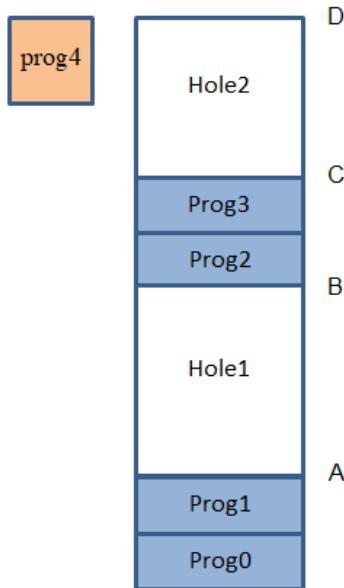
Odpowiedź:  ✓

Poprawna odpowiedź to: 1

**Pytanie 13**

Poprawnie

Punkty: 3,00 z 3,00



In the above memory allocation state, 4 programs are already in memory, and 5th program is waiting to be loaded into the memory. The borders of the holes are:

- A - 3K
- B - 7K
- C - 12K
- D - 14K

The memory is allocated to the programs in the best-fit rule, without making a new hole if the allocated block is larger than the demand.

What will be the internal fragmentation after loading the program Prog4 of size 2K into memory?

Odpowiedź:

===== for teacher =====

4 2

Poprawna odpowiedź to: 0

**Pytanie 14**

Poprawnie

Punkty: 3,00 z 3,00

The virtual address consists of 8b page number and 8b offset. The page index table is shown below (index, content). For decimal address 1840, binary 0000 0111 0011 0000, enter the physical address in the form: frame number.offset (as decimal numbers, offset in 3 digits). For example, for a physical address consisting of frame 0 and offset 18, specify 0.018. If there is no physical address for the given virtual address, then -1 should be specified.

7	4
6	-1
5	7
4	11
3	6
2	-1
1	2
0	1

Odpowiedź: 4.048 ✓

Poprawna odpowiedź to: 4,048

**Pytanie 15**

Poprawnie

Punkty: 3,00 z 3,00

What is the average time in the system for tasks in the batch incoming in this order, using FCFS algorithm?

task	1	2	3	4
processing time	3,1	6,7	2,8	1,1

Odpowiedź: 9,8 ✓

Poprawna odpowiedź to: 9,8

**Pytanie 16**

Poprawnie

Punkty: 3,00 z 3,00

The organization of memory and processor is word-based. A word means 16 bits (int also takes 1 16-bit word). Hexadecimal values are preceded by a # character.

variable a has the value #a0c0

top of the stack (full descending, i.e. the stack pointer points to the most recently put element on the stack, and the stack expands towards lower addresses) #c100

stack frame before subroutine B call #c1010

address of subroutine B #1021

Calling rules: Parameters are put on the stack in accordance with the convention of the C language, i.e. starting from the last one, without a static connection, the result of the function is passed in registers. The stack is shown after subroutine B is called by itself (recursively), at label point C. Subroutine B is called for the first time B(a-2); somewhere in the program from address #1011. Label C has address #1050.

regardless of the programming language, subroutine B has the form

B(int i);

{

    int p=i+1;

    C:     B(i-3);

}

The content of the cell at address #c0f9: dynamic link ✓

Address	content
#c100	????
#c0ff	#a0be
#c0fe	#1012
#c0fd	#c010
#c0fc	#a0bf
#c0fb	#a0bb
#c0fa	#1051
#c0f9	#c0fd
#c0f8	#a0bc
#c0f7	????
#c0f6	????

Twoja odpowiedź jest poprawna.

The correct answer is:

The organization of memory and processor is word-based. A word means 16 bits (int also takes 1 16-bit word). Hexadecimal values are preceded by a # character.

variable a has the value #a0c0

top of the stack (full descending, i.e. the stack pointer points to the most recently put element on the stack, and the stack expands towards lower addresses) #c100

stack frame before subroutine B call #c1010

address of subroutine B #1021

**Calling rules:** Parameters are put on the stack in accordance with the convention of the C language, i.e. starting from the last one, without a static connection, the result of the function is passed in registers. The stack is shown after subroutine B is called by itself (recursively), at label point C. Subroutine B is called for the first time B(a-2); somewhere in the program from address #1011. Label C has address #1050.

regardless of the programming language, subroutine B has the form

```
B(int i);
{
    int p=i+1;
    C: B(i-3);
}
```

The content of the cell at address #c0f9:[dynamic link]

Address	content
#c100	????
#c0ff	#a0be
#c0fe	#1012
#c0fd	#c010
#c0fc	#a0bf
#c0fb	#a0bb
#c0fa	#1051
#c0f9	#c0fd
#c0f8	#a0bc
#c0f7	????
#c0f6	????

### Question 17

Correctly

Points: 3.00 out of 3.00

page	history of R
0	101100100
1	0000010001
2	011011111
3	110110100

Using the above table of the history of R bit for the pages in LFU swapping, which page will be sent to the disk first? The oldest bit R is on the left. Provide a page number.

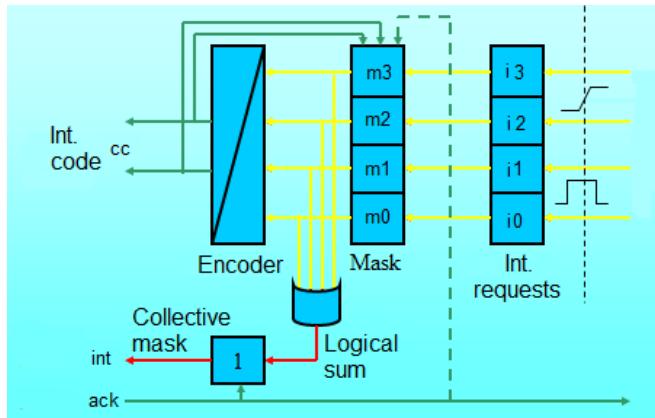
Answer:  ✓

The correct answer is: 1

**Question 18**

Incorrectly

Points: 0.00 out of 3.00



In the given interrupt controller structure, the interrupt mask is 1111 (from m3 to m0), and interrupts 0010 (from i3 to i0) are reported.

The interrupt with index 3 has the highest priority.

What will be the new value of the interrupt mask? Provide the bits .m3m2m1m0 (mask preceded by a point) for example .0101

Answer: 1101 ✖

The correct answer is: 0.1100

<b>Started on</b>	Wednesday, 19 June 2024, 12:15 PM
<b>State</b>	Finished
<b>Completed on</b>	Wednesday, 19 June 2024, 1:54 PM
<b>Time taken</b>	1 hour 38 mins
<b>Marks</b>	51.42/75.00
<b>Grade</b>	27.42 out of 40.00 (68.56%)

**Question 1**

Correct

Mark 1.00 out of 1.00

The system stack must provide space for:

Select one or more:

- a. Processor registers in as many copies as there are devices in the system +1
- b. Processor registers in as many copies as there are interrupt lines and possible software interrupts
- c. CPU registers
- d. Processor registers in as many copies as there are interrupt lines +1 ✓

Twoja odpowiedź jest poprawna.

The correct answer is: Processor registers in as many copies as there are interrupt lines +1

**Question 2**

Correct

Mark 1.00 out of 1.00

Twice consecutive execution in one process of operation P on a raised binary semaphore:

Select one or more:

- a. It doesn't change anything
- b. Causes the semaphore to get down ✓
- c. If a semaphore guards a critical region, it leads to a deadlock ✓
- d. Decreases semaphore value by 2

Twoja odpowiedź jest poprawna.

The correct answers are: If a semaphore guards a critical region, it leads to a deadlock, Causes the semaphore to get down

**Question 3**

Correct

Mark 1.00 out of 1.00

In UNIX, access rights are attributes:

Select one or more:

- a. A special table specifying access rights
- b. User descriptor
- c. A directory entry for a file
- d. An entry in the I-node table ✓

Twoja odpowiedź jest poprawna.

The correct answer is: An entry in the I-node table

**Question 4**

Correct

Mark 1.00 out of 1.00

The kernel (microkernel) is responsible for:

Select one or more:

- a. memory allocation and freeing
- b. interrupt handling (at the elementary level, then they are passed on to other layers). ✓
- c. synchronization of processes and devices with processes ✓
- d. task control ✓

Twoja odpowiedź jest poprawna.

The correct answers are: task control, synchronization of processes and devices with processes, interrupt handling (at the elementary level, then they are passed on to other layers).

**Question 5**

Correct

Mark 1.00 out of 1.00

In multi-level interrupts (vectored interrupts) the jump is performed:

Select one or more:

- a. to the address specified in the given processor register
- b. to a fixed address
- c. to the address contained in the device driver, provided by the I/O instruction
- d. according to the table indexed by the interrupt number ✓

Twoja odpowiedź jest poprawna.

The correct answer is: according to the table indexed by the interrupt number

**Question 6**

Correct

Mark 1.00 out of 1.00

In UNIX, the disk contains the following areas:

Select one or more:

- a. Files data ✓
- b. I-node table ✓
- c. Directories
- d. SuperBlock ✓

Twoja odpowiedź jest poprawna.

The correct answers are: SuperBlock, I-node table, Files data

**Question 7**

Correct

Mark 1.00 out of 1.00

What is this technique where the operating system gathers programs and data together before processing?

- a. Batch processing ✓
- b. Real-time processing
- c. Distributed processing
- d. Interactive processing

The correct answer is: Batch processing

**Question 8**

Correct

Mark 1.00 out of 1.00

The page fault interrupt is used to:

Select one or more:

- a. Detection of an attempt to write outside the address space of the frame
- b. Whether the frame is empty or contains a page
- c. Downloads to the memory of the requested page ✓
- d. Detection of an access attempt from a frame not allocated to the program

Twoja odpowiedź jest poprawna.

The correct answer is: Downloads to the memory of the requested page

**Question 9**

Correct

Mark 1.00 out of 1.00

Scheduling algorithms can be:

- a. interrupting
- b. term changing
- c. indulgent ✓
- d. preemptive ✓

The correct answers are: indulgent, preemptive

**Question 10**

Partially correct

Mark 0.67 out of 1.00

The resources of the computer system are:

Select one or more:

- a. Primary memory ✓
- b. User programs
- c. Processor time
- d. Peripheral devices ✓

Twoja odpowiedź jest częściowo poprawna.

You have correctly selected 2.

The correct answers are: Primary memory, Peripheral devices, Processor time

**Question 11**

Correct

Mark 1.00 out of 1.00

When is the scheduler called?

Select one or more:

- a. at the request of a user task
- b. when the scheduler decides itself
- c. at the end of the execution of each kernel procedure ✓
- d. at the start of execution of each kernel procedure

Twoja odpowiedź jest poprawna.

The correct answer is: at the end of the execution of each kernel procedure

**Question 12**

Correct

Mark 1.00 out of 1.00

A memory management technique in which the system divides memory into equal-sized portions to easily manage relocation is called:

Select one or more:

- a. paging ✓
- b. mapping
- c. fragmentation
- d. swapping

Twoja odpowiedź jest poprawna.

The correct answer is: paging

**Question 13**

Correct

Mark 1.00 out of 1.00

What does the file system layer do?

- a. Manages files ✓
- b. Manages remote file systems
- c. Manages remote files
- d. Manages relationships between files

The correct answer is: Manages files

**Question 14**

Correct

Mark 1.00 out of 1.00

Indulgent scheduling is the best mechanism for:

Select one or more:

- a. system with many process classes
- b. time-sharing system
- c. real-time system ✓
- d. every system

Twoja odpowiedź jest poprawna.

The correct answer is: real-time system

**Question 15**

Correct

Mark 1.00 out of 1.00

What does the kernel do when there is no task (process) to run?

Select one or more:

- a. switches off the power supply
- b. resets the entire system
- c. executes an infinite loop in the kernel until a task arrives
- d. starts the idle task ✓

Twoja odpowiedź jest poprawna.

The correct answer is: starts the idle task

**Question 16**

Correct

Mark 1.00 out of 1.00

The internal state of the program supervisor layer is available for:

- a. OS kernel ✓
- b. Applications
- c. File system layer
- d. User programs

The correct answer is: OS kernel

**Question 17**

Correct

Mark 1.00 out of 1.00

Discontinuous allocation is the result of:

Select one or more:

- a. compacting
- b. paging ✓
- c. relocation
- d. segmentation ✓

Twoja odpowiedź jest poprawna.

The correct answers are: paging, segmentation

**Question 18**

Correct

Mark 1.00 out of 1.00

Paging is in thrashing if:

- a. the system spends more time paging than execution ✓
- b. the system spends less time paging than execution
- c. page faults occur
- d. page cannot be swapped

The correct answer is: the system spends more time paging than execution

**Question 19**

Correct

Mark 1.00 out of 1.00

The return from interrupt instruction:

Select one or more:

- a. restores the process stack
- b. restores the conditions register ✓
- c. causes the processor to switch to a process other than the interrupted one
- d. restores the program counter ✓

Twoja odpowiedź jest poprawna.

The correct answers are: restores the program counter, restores the conditions register

**Question 20**

Incorrect

Mark 0.00 out of 1.00

Dynamic relocation requires the use of:

Select one or more:

- a. base register (DATUM) ✓
- b. status register
- c. program counter
- d. limit register ✗

Twoja odpowiedź jest niepoprawna.

The correct answer is: base register (DATUM)

**Question 21**

Incorrect

Mark 0.00 out of 1.00

A program compiled for execution in paged memory can be executed in regular memory.

True ✗

False

The correct answer is 'False'.

**Question 22**

Incorrect

Mark 0.00 out of 1.00

Page thrashing is a phenomenon involving:

Select one or more:

- a. frequent downloading of pages that have just been swapped out from memory ✓
- b. loading the same page over and over again ✗
- c. frequent context changes that require page index tables to be reloaded
- d. frequently changing the values of bits describing pages in frames

Twoja odpowiedź jest niepoprawna.

The correct answer is: frequent downloading of pages that have just been swapped out from memory

**Question 23**

Correct

Mark 1.00 out of 1.00

Semaphores are used to solve the problem:

- a. races
- b. mutual exclusion ✓
- c. process scheduling
- d. Belady problem

The correct answer is: mutual exclusion

**Question 24**

Correct

Mark 1.00 out of 1.00

Dirty frame is:

Select one or more:

- a. modified ✓
- b. candidate to be swapped first
- c. read-only frame, tried to be written to
- d. execute-only frame, tried to be read

Twoja odpowiedź jest poprawna.

The correct answer is: modified

**Question 25**

Correct

Mark 1.00 out of 1.00

The common allocation queue to fixed blocks of memory of equal size causes:

Select one or more:

- a. need for compaction
- b. external fragmentation
- c. internal fragmentation ✓

Twoja odpowiedź jest poprawna.

The correct answer is: internal fragmentation

**Question 26**

Correct

Mark 1.00 out of 1.00

Which scheduler needs to make a decision the fastest?

- a. medium-term
- b. long-term
- c. short-term ✓
- d. additional

The correct answer is: short-term

**Question 27**

Correct

Mark 1.00 out of 1.00

In operating system:

Select one or more:

- a. timer interrupt may not be handled
- b. some exceptions are handled, some not
- c. the decision to handle an exception or not is made dynamically
- d. every exception must be handled ✓

Twoja odpowiedź jest poprawna.

The correct answer is: every exception must be handled

**Question 28**

Partially correct

Mark 0.50 out of 1.00

Static relocation is performed by:

- a. Linker ✓
- b. Compiler
- c. Segment descriptors
- d. Paging system

The correct answers are: Compiler, Linker

**Question 29**

Correct

Mark 1.00 out of 1.00

Operation V on a raised binary semaphore:

Select one or more:

- a. Increases semaphore value by 1
- b. It does not change the value of the semaphore ✓
- c. It is stored in order to be able to perform as many operations P as there were V

Twoja odpowiedź jest poprawna.

The correct answer is: It does not change the value of the semaphore

**Question 30**

Partially correct

Mark 0.25 out of 1.00

Fragmentation is implied by:

Select one or more:

- a. Internal by partitioning into quantized blocks
- b. External by resizing allocated blocks
- c. External by segmentation
- d. Internal by paging
- e. External by freeing blocks in a deallocation order not reverse to allocation ✓

Twoja odpowiedź jest częściowo poprawna.

You have correctly selected 1.

The correct answers are: Internal by paging, Internal by partitioning into quantized blocks, External by freeing blocks in a deallocation order not reverse to allocation, External by resizing allocated blocks

**Question 31**

Correct

Mark 1.00 out of 1.00

A process can appear in the pool of scheduling processes as a result of:

Select one or more:

- a. Performing the P operation on the semaphore
- b. Performing V operation on the semaphore ✓
- c. Completing an I/O operation ✓
- d. Starting a new process ✓

Twoja odpowiedź jest poprawna.

The correct answers are: Performing V operation on the semaphore, Starting a new process, Completing an I/O operation

**Question 32**

Partially correct

Mark 0.50 out of 1.00

External fragmentation can be avoided by:

Select one or more:

- a. Freeing memory blocks in the reverse order to allocation
- b. Freeing memory blocks in allocation order
- c. Application of the onion algorithm
- d. Allocation of fixed size static memory blocks ✓

Twoja odpowiedź jest częściowo poprawna.

You have correctly selected 1.

The correct answers are: Allocation of fixed size static memory blocks, Freeing memory blocks in the reverse order to allocation

**Question 33**

Correct

Mark 1.00 out of 1.00

The Test-And-Set or Compare-And-Swap instruction has the following characteristics:

Select one or more:

- a. It is possible to use only in 1-processor systems
- b. It is possible to use only on computers with common memory ✓
- c. Requires active waiting from tasks ✓
- d. It is possible to deadlock with TAS/CAS operations on multiple variables ✓

Twoja odpowiedź jest poprawna.

The correct answers are: Requires active waiting from tasks, It is possible to use only on computers with common memory, It is possible to deadlock with TAS/CAS operations on multiple variables

**Question 34**

Correct

Mark 1.00 out of 1.00

Using the Test-And-Set instruction in synchronization:

Select one or more:

- a. It requires processes to actively wait ✓
- b. Stops the processor if 0 is read
- c. Requires organizing inactive waiting in queues
- d. Requires the use of semaphores

Twoja odpowiedź jest poprawna.

The correct answer is: It requires processes to actively wait

**Question 35**

Incorrect

Mark 0.00 out of 1.00

Address translation is handled by a unit called (give the abbreviation):

Answer: MMU (Memory Management Unit)



The correct answer is: MMU

**Question 36**

Incorrect

Mark 0.00 out of 1.00

Dynamic relocation:

Select one or more:

- a. Requires hardware support in the form of a LIMIT register
- b. Requires hardware support in the form of a DATUM register
- c. Allows for temporal elimination of external fragmentation
- d. Requires relative references to be addressed when the program is loaded into memory ✗

Twoja odpowiedź jest niepoprawna.

The correct answers are: Requires hardware support in the form of a DATUM register, Allows for temporal elimination of external fragmentation

**Question 37**

Incorrect

Mark 0.00 out of 1.00

Opening a file in UNIX writes the following entries in the operating system's data structures:

Select one or more:

- a. Inserting a new entry into the Table of Active I-nodes or increasing the counter in an existing entry
- b. Inserting a new entry into the System Table of Open Files or incrementing a counter in an existing entry ✗
- c. Inserting a new item into the Table of Open Files of the Process ✓

Twoja odpowiedź jest niepoprawna.

The correct answers are: Inserting a new entry into the Table of Active I-nodes or increasing the counter in an existing entry, Inserting a new item into the Table of Open Files of the Process

**Question 38**

Correct

Mark 1.00 out of 1.00

What type of code can multiple processes execute simultaneously?

Select one or more:

- a. reentrant ✓
- b. dynamically relocated
- c. self-modifying
- d. binary

Twoja odpowiedź jest poprawna.

The correct answer is: reentrant

**Question 39**

Correct

Mark 1.00 out of 1.00

Address translation aims to:

Select one or more:

- a. detecting the phenomenon of locality of references
- b. converting a physical address to a virtual one
- c. Generating a "frame error" interrupt when the page is out of memory
- d. converting a virtual address to a physical one ✓

Twoja odpowiedź jest poprawna.

The correct answer is: converting a virtual address to a physical one

**Question 40**

Correct

Mark 1.00 out of 1.00

The optimal scheduling algorithm in terms of minimizing the average time in the system of a given task is:

Select one or more:

- a. SJF ✓
- b. time slicing
- c. priority
- d. FCFS

Twoja odpowiedź jest poprawna.

The correct answer is: SJF

**Question 41**

Correct

Mark 1.00 out of 1.00

Inter-process communication can be organized using:

Select one or more:

- a. messages ✓
- b. shared directly addressable memory fields ✓
- c. shared memory fields accessible through system calls ✓
- d. interrupts

Twoja odpowiedź jest poprawna.

The correct answers are: messages, shared directly addressable memory fields, shared memory fields accessible through system calls

**Question 42**

Partially correct

Mark 0.50 out of 1.00

Which of the following memory allocation schemes can cause external fragmentation?

- a. Multiple contiguous fixed partitions of equal size
- b. Paging
- c. Sweeping
- d. Multiple contiguous fixed partitions of various sizes
- e. Segmentation ✓

The correct answers are: Segmentation, Sweeping

**Question 43**

Correct

Mark 1.00 out of 1.00

For concurrency in OS:

- a. timer interrupts are necessary
- b. interrupt handling is necessary ✓
- c. special processor support is required
- d. cache memory is necessary

The correct answer is: interrupt handling is necessary

**Question 44**

Correct

Mark 1.00 out of 1.00

Which of the following information is stored on task switching?

- a. I/O status information ✓
- b. contents of general purpose registers, program counter, and similar registers available to the program ✓
- c. Contents of the instruction register and similar registers
- d. scheduler data ✓

The correct answers are: I/O status information, scheduler data, contents of general purpose registers, program counter, and similar registers available to the program

**Question 45**

Correct

Mark 1.00 out of 1.00

The conversion of the effective address to the physical one takes place:

Select one or more:

- a. in the bus arbiter
- b. in the memory management unit ✓
- c. in the arithmetic-logic unit
- d. in the sequencer

Twoja odpowiedź jest poprawna.

The correct answer is: in the memory management unit

**Question 46**

Incorrect

Mark 0.00 out of 1.00

The logical address is also:

Select one or more:

- a. Relative address ✗
- b. Effective address ✓
- c. Absolute address
- d. Physical address

Twoja odpowiedź jest niepoprawna.

The correct answer is: Effective address

**Question 47**

Correct

Mark 1.00 out of 1.00

Which of the following statements is true for system level threads?

- a. Kernel-level threads require their descriptors in the kernel. ✓
- b. Multithreaded applications cannot use multiprocessing.
- c. User-level threads can be synchronized by the kernel.
- d. The threading implementation at the kernel level is done by the thread library attached to the program.

The correct answer is: Kernel-level threads require their descriptors in the kernel.

**Question 48**

Correct

Mark 1.00 out of 1.00

Address translation mechanism:

Select one or more:

- a. Concatenates the page number and page offset
- b. Concatenates the frame number and offset on the page ✓
- c. Adds the frame number to the page number
- d. Concatenates the frame number and page number

Twoja odpowiedź jest poprawna.

The correct answer is: Concatenates the frame number and offset on the page

**Question 49**

Correct

Mark 1.00 out of 1.00

The effective address is also:

Select one or more:

- a. Logical address ✓
- b. Physical address
- c. Indirect address
- d. Absolute address

Twoja odpowiedź jest poprawna.

The correct answer is: Logical address

**Question 50**

Partially correct

Mark 0.50 out of 1.00

Dynamic relocation is performed by:

- a. Loader
- b. Linker
- c. Paging system ✓
- d. Special registers (DATUM)

The correct answers are: Special registers (DATUM), Paging system

**Question 51**

Correct

Mark 1.00 out of 1.00

What is included in the context that must be maintained for a synchronous precision interrupt?

Select one or more:

- a. instruction register
- b. collective or individual interrupt mask ✓
- c. program counter ✓
- d. general purpose registers ✓

Twoja odpowiedź jest poprawna.

The correct answers are: general purpose registers, program counter, collective or individual interrupt mask

**Question 52**

Partially correct

Mark 0.50 out of 1.00

System/user threads:

Select one or more:

- a. User-level thread descriptors are stored in the address space of the program.
- b. User-level threads share the same stack.
- c. User-level threads share the same execution context. ✓

Twoja odpowiedź jest częściowo poprawna.

You have correctly selected 1.

The correct answers are: User-level thread descriptors are stored in the address space of the program., User-level threads share the same execution context.

**Question 53**

Correct

Mark 1.00 out of 1.00

How is exception identification performed?

Select one or more:

- a. the specification of hardware interrupts and errors is given over the data bus
- b. the specification of hardware interrupts is given over the data bus ✓
- c. all exceptions are specified using the data bus
- d. the specification of hardware interrupts and traps is given over the data bus

Twoja odpowiedź jest poprawna.

The correct answer is: the specification of hardware interrupts is given over the data bus

**Question 54**

Correct

Mark 1.00 out of 1.00

The combination of paging and segmentation consists in:

Select one or more:

- a. the use of a segment table or a pool of segment registers treated as an additional, superior level of paging ✓
- b. Generating a "frame error" interrupt when the frame containing the page does not belong to the current segment
- c. dividing pages into segments
- d. identifying segments with pages

Twoja odpowiedź jest poprawna.

The correct answer is: the use of a segment table or a pool of segment registers treated as an additional, superior level of paging

**Question 55**

Incorrect

Mark 0.00 out of 1.00

Dynamic relocation is performed by:

- a. Segment descriptors
- b. Linker
- c. Loader
- d. Compiler ✗

The correct answer is: Segment descriptors

**Question 56**

Incorrect

Mark 0.00 out of 1.00

The behavior of the exchange algorithm opposite to that expected with the measures taken is called:

Answer: Thrashing



The correct answer is: anomaly

**Question 57**

Correct

Mark 1.00 out of 1.00

The hardware resources of a computer system are:

Select one or more:

- a. Primary memory ✓
- b. Windows on the screen
- c. Processor time ✓
- d. Peripheral devices ✓

Twoja odpowiedź jest poprawna.

The correct answers are: Processor time, Primary memory, Peripheral devices

**Question 58**

Partially correct

Mark 0.50 out of 1.00

How does the operating system call the task completion subroutine?

3. recreates the context programmatically and executes the IRET instruction ✗
2. sets the trace in the terminating subroutine to the current position ✓
4. builds an interrupt vector on the system stack pointing to the terminating subroutine code ✗
1. builds the frame of the terminating subroutine on the task stack ✓

Twoja odpowiedź jest częściowo poprawna.

You have correctly selected 2.

The correct answer is: 3. → builds an interrupt vector on the system stack pointing to the terminating subroutine code, 2. → sets the trace in the terminating subroutine to the current position, 4. → recreates the context programmatically and executes the IRET instruction, 1. → builds the frame of the terminating subroutine on the task stack

**Question 59**

Correct

Mark 1.00 out of 1.00

What mechanism is part of time-sharing systems?

- a. short-term scheduler ✓
- b. swapping
- c. long-term scheduler
- d. medium-term scheduler

The correct answer is: short-term scheduler

**Question 60**

Partially correct

Mark 0.50 out of 1.00

On UNIX, the number of files is directly limited by:

Select one or more:

- a. The number of bits of the disk address
- b. The size of the space allocated for files
- c. I-node table size ✓
- d. The number of bits of the field describing the size of the file
- e. Allocation unit size

Twoja odpowiedź jest częściowo poprawna.

You have correctly selected 1.

The correct answers are: I-node table size, The size of the space allocated for files

**Question 61**

Correct

Mark 5.00 out of 5.00

What is the average time in the system for tasks in the batch, using SJF algorithm?

The system is equipped with 2 processors

task	1	2	3	4
processing time	3.4	5.5	3	1.1

Answer: 4.3 ✓

The correct answer is: 4.3

**Question 62**

Incorrect

Mark 0.00 out of 5.00

In RAID 4, data is placed in Strips that are "scattered" over the data disks, so that each subsequent strip is on the next data disk, modulo the number of disks. For this, there is a parity disk that holds the parity bits of zeroth bits, first bits, second bits, etc., equal-numbered strips divided by the number of data disks, for example, strips 0-3, 4-7, 8-11, etc.::



the beginning of strip 0,1,2,3 looks like this:

0	1	0	0	1	Parity disk
1	1	1	1	1	Disk 3
1	0	1	1	0	Disk 2
1	0	1	0	1	Disk 1
0	1	1	0	0	Disk 0

In the parity strip, the values are placed so that the parity bit keeps the corresponding strip bits 0-3 odd.

Disk 3 has been corrupted and always reads 1. After replacing the disk with a new one, what values should be put in the strip on disk 3?

Answer:  ×

The correct answer is: 11001

**Question 63**

Incorrect

Mark 0.00 out of 5.00

Assuming memory cells are 1-byte, the page number in the address field is 12 bits, the offset is 12 bits, the frame number is 10 bits, and all entries in the TIS page index table are on a 16-bit word boundary, enter:

- TIS maximum size of the program in kB

Answer:  ×

The correct answer is: 8

# Exam 1

Rozpoczęto	środa, 19 czerwca 2024, 12:16
Stan	Ukończone
Ukończono	środa, 19 czerwca 2024, 14:13
Wykorzystany czas	1 godzina 57 min.
Punkty	54,17/75,00
Ocena	<b>28,89</b> pkt. na 40,00 pkt. możliwych do uzyskania ( <b>72,22%</b> )

## Pytanie 1

Poprawnie

Punkty: 1,00 z 1,00

Oflaguj pytanie

### Treść pytania

In multi-level interrupts (vectored interrupts) the jump is performed:

Pytanie 1 Wybierz wszystkie poprawne:

- a.  
to a fixed address
- b.  
according to the table indexed by the interrupt number
- c.  
to the address specified in the given processor register
- d.  
to the address contained in the device driver, provided by the I/O instruction

### Informacja zwrotna

Twoja odpowiedź jest poprawna.

Poprawna odpowiedź to: according to the table indexed by the interrupt number

## Pytanie 2

Poprawnie

Punkty: 1,00 z 1,00

Oflaguj pytanie

### Treść pytania

What are the functions of the kernel?

Pytanie 2 Odpowiedź

- a.  
File management
- b.  
Program management
- c.  
Memory management

d.

Interrupt handling

Informacja zwrotna

Poprawna odpowiedź to: Interrupt handling

**Pytanie 3**

Poprawnie

Punkty: 1,00 z 1,00

Oflaguj pytanie

Treść pytania

What type of code can be executed simultaneously on multiple processors?

Pytanie 3 Wybierz wszystkie poprawne:

- a.  
dynamically relocated
- b.  
reentrant
- c.  
binary
- d.  
self-modifying

Informacja zwrotna

Twoja odpowiedź jest poprawna.

Poprawna odpowiedź to: reentrant

**Pytanie 4**

Poprawnie

Punkty: 1,00 z 1,00

Oflaguj pytanie

Treść pytania

Static relocation is performed by:

Pytanie 4 Odpowiedź

- a.  
Compiler
- b.  
Special registers (DATUM)
- c.  
Paging system
- d.  
Segment descriptors

Informacja zwrotna

Poprawna odpowiedź to: Compiler

**Pytanie 5**

Niepoprawnie

Punkty: 0,00 z 1,00

Oflaguj pytanie

**Treść pytania**

MMU uses index tables to:

Pytanie 5Wybierz wszystkie poprawne:

- a.  
generate a relative address
- b.  
generate an effective address
- c.  
generating a physical address
- d.  
generate a logical address

**Informacja zwrotna**

Twoja odpowiedź jest niepoprawna.

Poprawna odpowiedź to: generating a physical address

**Pytanie 6**

Poprawnie

Punkty: 1,00 z 1,00

Oflaguj pytanie

**Treść pytania**

To end the interrupt service, use the following instruction:

Pytanie 6Wybierz wszystkie poprawne:

- a.  
return from subroutine call
- b.  
special return instruction
- c.  
regular jump instruction
- d.  
none - the processor will end the service automatically

**Informacja zwrotna**

Twoja odpowiedź jest poprawna.

Poprawna odpowiedź to: special return instruction

**Pytanie 7**

Poprawnie

Punkty: 1,00 z 1,00

Oflaguj pytanie

**Treść pytania**

Physical address:

Pytanie 7Wybierz wszystkie poprawne:

- a.  
indicates a relative address to the segment register

- b.  
points to a cell in the process address space
- c.  
points to a location in the address space of primary memory
- d.  
is contained in the address field of the instruction

#### Informacja zwrotna

Twoja odpowiedź jest poprawna.

Poprawna odpowiedź to: points to a location in the address space of primary memory

### Pytanie 8

Niepoprawnie

Punkty: 0,00 z 1,00

Oflaguj pytanie

#### Treść pytania

In a FAT-based disk system, file size is directly limited by:

Pytanie 8 Wybierz wszystkie poprawne:

- a.  
The number of bits of the disk address
- b.  
Allocation unit size
- c.  
FAT table size
- d.  
The number of bits of the field describing the size of the file
- e.  
The size of the disk space

#### Informacja zwrotna

Twoja odpowiedź jest niepoprawna.

Prawidłowymi odpowiedziami są: The size of the disk space, The number of bits of the field describing the size of the file

### Pytanie 9

Poprawnie

Punkty: 1,00 z 1,00

Oflaguj pytanie

#### Treść pytania

The kernel (microkernel) is responsible for:

Pytanie 9 Wybierz wszystkie poprawne:

- a.  
interrupt handling (at the elementary level, then they are passed on to other layers).
- b.  
memory allocation and freeing

- c.  
task control
- d.  
synchronization of processes and devices with processes

#### Informacja zwrotna

Twoja odpowiedź jest poprawna.

Prawidłowymi odpowiedziami są: task control, synchronization of processes and devices with processes, interrupt handling (at the elementary level, then they are passed on to other layers).

### Pytanie 10

Poprawnie

Punkty: 1,00 z 1,00

Oflaguj pytanie

#### Treść pytania

Threads in operating system:

Pytanie 10 Wybierz wszystkie poprawne:

- a.  
They share context except registers and stack
- b.  
They share the entire context
- c.  
They share context except stack

#### Informacja zwrotna

Twoja odpowiedź jest poprawna.

Poprawna odpowiedź to: They share context except registers and stack

### Pytanie 11

Niepoprawnie

Punkty: 0,00 z 1,00

Oflaguj pytanie

#### Treść pytania

The effective address is also:

Pytanie 11 Wybierz wszystkie poprawne:

- a.  
Physical address
- b.  
Logical address
- c.  
Indirect address
- d.  
Absolute address

#### Informacja zwrotna

Twoja odpowiedź jest niepoprawna.

Poprawna odpowiedź to: Logical address

Pytanie 12

Częściowo poprawnie

Punkty: 0,67 z 1,00

Oflaguj pytanie

Treść pytania

The page fault exception is specific in that:

Pytanie 12 Wybierz wszystkie poprawne:

- a.  
there is no return to the program from it
- b.  
is reported in the "middle" of an instruction execution
- c.  
execution of the instruction may require decrementing the program counter
- d.  
continuation of the instruction execution may require the saving of internal processor registers storing intermediate values

Informacja zwrotna

Twoja odpowiedź jest częściowo poprawna.

Poprawnie wybrałeś (-łaś): 2.

Prawidłowymi odpowiedziami są: is reported in the "middle" of an instruction execution, execution of the instruction may require decrementing the program counter, continuation of the instruction execution may require the saving of internal processor registers storing intermediate values

Pytanie 13

Poprawnie

Punkty: 1,00 z 1,00

Oflaguj pytanie

Treść pytania

Virtual memory consists of:

Pytanie 13 Wybierz wszystkie poprawne:

- a.  
cache and storage memory
- b.  
main memory and cache
- c.  
primary memory and cloud storage
- d.  
primary memory and storage memory

Informacja zwrotna

Twoja odpowiedź jest poprawna.

**Poprawna odpowiedź to: primary memory and storage memory**

**Pytanie 14**

Niepoprawnie

Punkty: 0,00 z 1,00

Oflaguj pytanie

**Treść pytania**

The scheduling goal, which is to occupy processors as efficiently as possible, is:

Pytanie 14 Wybierz wszystkie poprawne:

- a. throughput
- b. utilization
- c. response time

**Informacja zwrotna**

Twoja odpowiedź jest niepoprawna.

Poprawna odpowiedź to: utilization

**Pytanie 15**

Niepoprawnie

Punkty: 0,00 z 1,00

Oflaguj pytanie

**Treść pytania**

The use of timer interrupts is necessary:

Pytanie 15 Wybierz wszystkie poprawne:

- a. In real-time systems
- b. In multiuser systems
- c. In multiprogram systems
- d. In concurrent systems

**Informacja zwrotna**

Twoja odpowiedź jest niepoprawna.

Poprawna odpowiedź to: In multiuser systems

**Pytanie 16**

Niepoprawnie

Punkty: 0,00 z 1,00

Oflaguj pytanie

**Treść pytania**

Page thrashing is a phenomenon involving:

Pytanie 16 Wybierz wszystkie poprawne:

- a.  
Frequent loading of pages that have just been ejected from memory
- b.  
Loading the same page over and over again
- c.  
Frequently changing the values of bits describing pages in frames
- d.  
Frequent context changes that require page index tables to be reloaded to MMU cache

#### Informacja zwrotna

Twoja odpowiedź jest niepoprawna.

Poprawna odpowiedź to: Frequent loading of pages that have just been ejected from memory

#### Pytanie 17

Niepoprawnie

Punkty: 0,00 z 1,00

Oflaguj pytanie

#### Treść pytania

MMU uses index tables to:

Pytanie 17 Wybierz wszystkie poprawne:

- a.  
generate an effective address
- b.  
generate a logical address
- c.  
generate a physical address
- d.  
generate a relative address

#### Informacja zwrotna

Twoja odpowiedź jest niepoprawna.

Poprawna odpowiedź to: generate a physical address

#### Pytanie 18

Poprawnie

Punkty: 1,00 z 1,00

Oflaguj pytanie

#### Treść pytania

At the suspended state is a process that:

Pytanie 18 Wybierz wszystkie poprawne:

- a.  
occupies a processor
- b.  
fills the processor idle time

- c.  
waits for a processor
- d.  
waits for an I/O operation to complete

#### Informacja zwrotna

Twoja odpowiedź jest poprawna.

Poprawna odpowiedź to: waits for an I/O operation to complete

#### Pytanie 19

Częściowo poprawnie  
Punkty: 0,50 z 1,00

Oflaguj pytanie

#### Treść pytania

Which of the following memory allocation schemes causes external fragmentation?

#### Pytanie 19 Odpowiedź

- a.  
Segmentation
- b.  
Paging
- c.  
Multiple contiguous fixed partitions of equal size
- d.  
Multiple contiguous fixed partitions of various sizes

#### Informacja zwrotna

Prawidłowymi odpowiedziami są: Segmentation, Multiple contiguous fixed partitions of various sizes

#### Pytanie 20

Poprawnie  
Punkty: 1,00 z 1,00

Oflaguj pytanie

#### Treść pytania

The optimal scheduling algorithm in terms of minimizing the average time in the system of a given task is:

#### Pytanie 20 Wybierz wszystkie poprawne:

- a.  
time slicing
- b.  
FCFS
- c.  
priority
- d.  
SJF

**Informacja zwrotna**  
Twoja odpowiedź jest poprawna.  
Poprawna odpowiedź to: SJF

**Pytanie 21**

Niepoprawnie

Punkty: 0,00 z 1,00

Oflaguj pytanie

**Treść pytania**  
Which of the following interrupts a running process?

Pytanie 21Odpowiedź

- a.  
Power fail interrupt
- b.  
Scheduler
- c.  
Timer interrupts
- d.  
Hardware interrupt

**Informacja zwrotna**  
Prawidłowymi odpowiedziami są: Hardware interrupt, Timer interrupts, Power fail interrupt

**Pytanie 22**

Poprawnie

Punkty: 1,00 z 1,00

Oflaguj pytanie

**Treść pytania**  
Conditional variables in a monitor  
Pytanie 22Wybierz wszystkie poprawne:

- a.  
They are used to check whether the conditions for process continuation are met
- b.  
They are used to suspend processes that cannot run because the conditions for their continuation are not met
- c.  
They guard access to the critical region of the monitor

**Informacja zwrotna**  
Twoja odpowiedź jest poprawna.  
Poprawna odpowiedź to: They are used to suspend processes that cannot run because the conditions for their continuation are not met

**Pytanie 23**

Poprawnie

Punkty: 1,00 z 1,00

Oflaguj pytanie

### Treść pytania

Paging is in thrashing if:

Pytanie 23Odpowiedź

- a.  
page faults occur
- b.  
page cannot be swapped
- c.  
the system spends more time paging than execution
- d.  
the system spends less time paging than execution

### Informacja zwrotna

Poprawna odpowiedź to: the system spends more time paging than execution

## Pytanie 24

Niepoprawnie

Punkty: 0,00 z 1,00

Oflaguj pytanie

### Treść pytania

In a FAT-based disk system (without sharing allocation units by files), the number of files is directly limited by:

Pytanie 24Wybierz wszystkie poprawne:

- a.  
The number of bits of the field describing the size of the file
- b.  
The number of bits of the disk address
- c.  
The size of the disk space
- d.  
Allocation unit size
- e.  
FAT table size

### Informacja zwrotna

Twoja odpowiedź jest niepoprawna.

Prawidłowymi odpowiedziami są: FAT table size, The size of the disk space

## Pytanie 25

Poprawnie

Punkty: 1,00 z 1,00

Oflaguj pytanie

### Treść pytania

The common allocation queue to fixed blocks of memory of equal size causes:

Pytanie 25 Wybierz wszystkie poprawne:

- a.  
need for compaction
- b.  
internal fragmentation
- c.  
external fragmentation

#### Informacja zwrotna

Twoja odpowiedź jest poprawna.

Poprawna odpowiedź to: internal fragmentation

### Pytanie 26

Poprawnie

Punkty: 1,00 z 1,00

Oflaguj pytanie

#### Treść pytania

The scheduler decisions take the form:

Pytanie 26 Wybierz wszystkie poprawne:

- a.  
change from waiting to ready state
- b.  
change from waiting to active state
- c.  
change from active to ready state
- d.  
change from ready to active state

#### Informacja zwrotna

Twoja odpowiedź jest poprawna.

Poprawna odpowiedź to: change from ready to active state

### Pytanie 27

Częściowo poprawnie

Punkty: 0,50 z 1,00

Oflaguj pytanie

#### Treść pytania

How does the operating system call the task completion subroutine?

- Odpowiedź 1 Pytanie 27 Wybierz...builds the frame of the terminating subroutine on the  
4. task stacksets the trace in the terminating subroutine to the current positionbuilds an  
interrupt vector on the system stack pointing to the terminating subroutine coderecreates  
the context programmatically and executes the IRET instruction

- Odpowiedź 2 Pytanie 27 Wybierz...builds the frame of the terminating subroutine on the  
1. task stacksets the trace in the terminating subroutine to the current positionbuilds an  
interrupt vector on the system stack pointing to the terminating subroutine coderecreates  
the context programmatically and executes the IRET instruction

Odpowiedź 3 Pytanie 27 Wybierz... builds the frame of the terminating subroutine on the task stack, sets the trace in the terminating subroutine to the current position, builds an interrupt vector on the system stack pointing to the terminating subroutine code, recreates the context programmatically and executes the IRET instruction

Odpowiedź 4 Pytanie 27 Wybierz... builds the frame of the terminating subroutine on the task stack, sets the trace in the terminating subroutine to the current position, builds an interrupt vector on the system stack pointing to the terminating subroutine code, recreates the context programmatically and executes the IRET instruction

#### Informacja zwrotna

Twoja odpowiedź jest częściowo poprawna.

Poprawnie wybrałeś (-łaś): 2.

Poprawna odpowiedź to: 4. → recreates the context programmatically and executes the IRET instruction, 1. → builds the frame of the terminating subroutine on the task stack, 3. → builds an interrupt vector on the system stack pointing to the terminating subroutine code, 2. → sets the trace in the terminating subroutine to the current position

### Pytanie 28

Poprawnie

Punkty: 1,00 z 1,00

Oflaguj pytanie

#### Treść pytania

Semaphores are used to solve the problem:

Pytanie 28 Odpowiedź

- a. process scheduling
- b. mutual exclusion
- c. races
- d. Belady problem

#### Informacja zwrotna

Poprawna odpowiedź to: mutual exclusion

### Pytanie 29

Poprawnie

Punkty: 1,00 z 1,00

Oflaguj pytanie

#### Treść pytania

Interrupt vector is saved in a case of:

Pytanie 29 Wybierz wszystkie poprawne:

- a. accepting a non-maskable interrupt
- b. jump with trace

- c.  
subroutine call
- d.  
accepting a hardware interrupt

#### Informacja zwrotna

Twoja odpowiedź jest poprawna.

Prawidłowymi odpowiedziami są: accepting a hardware interrupt, accepting a non-maskable interrupt, jump with trace

### Pytanie 30

Poprawnie

Punkty: 1,00 z 1,00

Oflaguj pytanie

#### Treść pytania

Allocation unit for file storage:

Pytanie 30Odpowiedź

- a.  
may be a variable in a partition
- b.  
It should be selected to match the characteristics of the data
- c.  
must be constant across the disk partition
- d.  
may differ between files on a partition

#### Informacja zwrotna

Poprawna odpowiedź to: must be constant across the disk partition

### Pytanie 31

Niepoprawnie

Punkty: 0,00 z 1,00

Oflaguj pytanie

#### Treść pytania

FIRST-FIT algorithm:

Pytanie 31Wybierz wszystkie poprawne:

- a.  
Causes external fragmentation
- b.  
It allows for fast determining whether there is a free block of the required size
- c.  
Avoids external fragmentation
- d.  
Requires an ascending sorting of the list of free blocks

#### Informacja zwrotna

Twoja odpowiedź jest niepoprawna.  
Poprawna odpowiedź to: Causes external fragmentation

**Pytanie 32**

Częściowo poprawnie  
Punkty: 0,50 z 1,00

Oflaguj pytanie

**Treść pytania**

On UNIX, the number of files is directly limited by:

Pytanie 32 Wybierz wszystkie poprawne:

- a. The number of bits of the field describing the size of the file
- b. Allocation unit size
- c. The size of the space allocated for files
- d. I-node table size
- e. The number of bits of the disk address

**Informacja zwrotna**

Twoja odpowiedź jest częściowo poprawna.

Poprawnie wybrałeś (-łaś): 1.

Prawidłowymi odpowiedziami są: I-node table size, The size of the space allocated for files

**Pytanie 33**

Poprawnie  
Punkty: 1,00 z 1,00

Oflaguj pytanie

**Treść pytania**

Processor access scheduling decisions may be made under which of the following circumstances?

Pytanie 33 Wybierz wszystkie poprawne:

- a. When a task goes from the active state to the waiting state
- b. When a task transitions from the active state to the ready state
- c. When a task terminates
- d. When a task goes from the waiting state to the ready state

**Informacja zwrotna**

Twoja odpowiedź jest poprawna.

Prawidłowymi odpowiedziami są: When a task goes from the active state to the waiting state, When a task transitions from the active state to the ready state, When a task goes from the waiting state to the ready state, When a task terminates

**Pytanie 34**

Niepoprawnie

Punkty: 0,00 z 1,00

Oflaguj pytanie

**Treść pytania**

Allocation unit for file storage:

Pytanie 34 Odpowiedź

- a.  
may vary between partitions
- b.  
may be a variable in a partition
- c.  
may differ between files in a partition
- d.  
it should be selected to match the characteristics of the data

**Informacja zwrotna**

Poprawna odpowiedź to: may vary between partitions

**Pytanie 35**

Poprawnie

Punkty: 1,00 z 1,00

Oflaguj pytanie

**Treść pytania**

The following situations cause the exceptions (processor internal interrupts) of the "error" type:

Pytanie 35 Wybierz wszystkie poprawne:

- a.  
memory reference beyond limit register value
- b.  
memory reference in the area of the page that is not in memory
- c.  
a reference to memory that is not in the address space
- d.  
an attempt to write to the page for which the "read only" bit is set

**Informacja zwrotna**

Twoja odpowiedź jest poprawna.

Prawidłowymi odpowiedziami są: a reference to memory that is not in the address space, memory reference beyond limit register value, an attempt to write to the page for which the "read only" bit is set

**Pytanie 36**

Poprawnie  
Punkty: 1,00 z 1,00

Oflaguj pytanie

### Treść pytania

Multiprogram systems:

Pytanie 36Odpowiedź

- a.  
It does any job faster
- b.  
They are easier to develop than single-program systems
- c.  
It holds more than one program in primary memory at the same time
- d.  
They are only used on large mainframe computers

### Informacja zwrotna

Poprawna odpowiedź to: It holds more than one program in primary memory at the same time

## Pytanie 37

Poprawnie  
Punkty: 1,00 z 1,00

Oflaguj pytanie

### Treść pytania

The direct resume rule means that:

Pytanie 37Wybierz wszystkie poprawne:

- a.  
The resuming process loses the critical region  
Proces wznowiający traci region krytyczny
- b.  
The resuming process gets a critical region after the resumed process exits the monitor
- c.  
The resuming process applies for the critical region just like other processes on monitor input

### Informacja zwrotna

Twoja odpowiedź jest poprawna.

Prawidłowymi odpowiedziami są: The resuming process loses the critical region  
Proces wznowiający traci region krytyczny, The resuming process applies for the critical region just like other processes on monitor input

## Pytanie 38

Poprawnie  
Punkty: 1,00 z 1,00

Oflaguj pytanie

### Treść pytania

System/user threads:

Pytanie 38 Wybierz wszystkie poprawne:

a.

User-level threads share the same stack.

b.

System level thread descriptors are stored in the operating system kernel.

c.

User-level threads share the same execution context.

#### Informacja zwrotna

Twoja odpowiedź jest poprawna.

Prawidłowymi odpowiedziami są: System level thread descriptors are stored in the operating system kernel., User-level threads share the same execution context.

Pytanie **39**

Poprawnie

Punkty: 1,00 z 1,00

Oflaguj pytanie

#### Treść pytania

What is true for simultaneous execution in the same context?

Pytanie 39 Odpowiedź

a.

The use of threads ensures concurrency within the process.

b.

A multiprocessor kernel can be concurrent

c.

The shared context forces threads to run on the same processor

d.

Threads minimize context switch time.

#### Informacja zwrotna

Prawidłowymi odpowiedziami są: Threads minimize context switch time., The use of threads ensures concurrency within the process., A multiprocessor kernel can be concurrent

Pytanie **40**

Niepoprawnie

Punkty: 0,00 z 1,00

Oflaguj pytanie

#### Treść pytania

What mechanism is part of time-sharing systems?

Pytanie 40 Odpowiedź

a.

short-term scheduler

b.

swapping

- c.  
medium-term scheduler
- d.  
long-term scheduler

#### Informacja zwrotna

Poprawna odpowiedź to: short-term scheduler

### Pytanie 41

Poprawnie

Punkty: 1,00 z 1,00

Oflaguj pytanie

#### Treść pytania

The following situations trigger "error" exceptions:

Pytanie 41 Wybierz wszystkie poprawne:

- a.  
extracode
- b.  
attempting to execute in user mode an instruction that is only legal in system mode
- c.  
page fault (also known as frame fault, frame error, page miss)
- d.  
attempting to execute an illegal instruction

#### Informacja zwrotna

Twoja odpowiedź jest poprawna.

Prawidłowymi odpowiedziami są: attempting to execute an illegal instruction, attempting to execute in user mode an instruction that is only legal in system mode

### Pytanie 42

Poprawnie

Punkty: 1,00 z 1,00

Oflaguj pytanie

#### Treść pytania

When an exception is raised in user mode, the operating system switches to the kernel system stack, and what happens when an exception is raised in system mode?

Pytanie 42 Wybierz wszystkie poprawne:

- a.  
nothing special, it builds the context on the kernel system stack
- b.  
switches to the next kernel system stack
- c.  
initializes the kernel system stack from the scratch

- d.  
switches back to the application program stack

Informacja zwrotna

Twoja odpowiedź jest poprawna.

Poprawna odpowiedź to: nothing special, it builds the context on the kernel system stack

Pytanie 43

Poprawnie

Punkty: 1,00 z 1,00

Oflaguj pytanie

Treść pytania

The number of condition variables is by definition in the monitor:

Pytanie 43 Wybierz wszystkie poprawne:

- a.  
as many as there are different conditions for the continuation of processes plus one for mutual exclusion
- b.  
one
- c.  
as many as there are different conditions for the continuation of processes
- d.  
two

Informacja zwrotna

Twoja odpowiedź jest poprawna.

Poprawna odpowiedź to: as many as there are different conditions for the continuation of processes

Pytanie 44

Poprawnie

Punkty: 1,00 z 1,00

Oflaguj pytanie

Treść pytania

Which of the following information is stored on task switching?

Pytanie 44 Odpowiedź

- a.  
Contents of datum, limit and other registers inaccessible to the program
- b.  
I/O status information
- c.  
scheduler data
- d.  
Contents of general purpose registers, program counter, and similar registers available to the program

### Informacja zwrotna

Prawidłowymi odpowiedziami są: I/O status information, scheduler data, Contents of datum, limit and other registers inaccessible to the program, Contents of general purpose registers, program counter, and similar registers available to the program

#### Pytanie 45

Niepoprawnie

Punkty: 0,00 z 1,00

Oflaguj pytanie

### Treść pytania

What mechanism is used to desynchronize processes with different relative speeds?

Pytanie 45 Wybierz wszystkie poprawne:

- a.  
preempting
- b.  
scheduling
- c.  
buffer
- d.  
interrupts

### Informacja zwrotna

Twoja odpowiedź jest niepoprawna.

Poprawna odpowiedź to: buffer

#### Pytanie 46

Niepoprawnie

Punkty: 0,00 z 1,00

Oflaguj pytanie

### Treść pytania

Page thrashing is a phenomenon involving:

Pytanie 46 Wybierz wszystkie poprawne:

- a.  
frequent context changes that require page index tables to be reloaded
- b.  
frequently changing the values of bits describing pages in frames
- c.  
frequent downloading of pages that have just been swapped out from memory
- d.  
loading the same page over and over again

### Informacja zwrotna

Twoja odpowiedź jest niepoprawna.

Poprawna odpowiedź to: frequent downloading of pages that have just been swapped out from memory

**Pytanie 47**

Niepoprawnie

Punkty: 0,00 z 1,00

Oflaguj pytanie

Treść pytania

Is IOW bit:

Pytanie 47 Wybierz wszystkie poprawne:

- a.  
reference bit
- b.  
protection bit
- c.  
enable bit

Informacja zwrotna

Twoja odpowiedź jest niepoprawna.

Poprawna odpowiedź to: protection bit

**Pytanie 48**

Poprawnie

Punkty: 1,00 z 1,00

Oflaguj pytanie

Treść pytania

Sequence of actions when starting a new task:

Odpowiedź 1 Pytanie 48 Wybierz...instruction to transfer control to the task initialize the

1. stack, fill the first frame memory allocation if this is the first task of the program filling in the descriptor in the kernel

Odpowiedź 2 Pytanie 48 Wybierz...instruction to transfer control to the task initialize the

2. stack, fill the first frame memory allocation if this is the first task of the program filling in the descriptor in the kernel

Odpowiedź 3 Pytanie 48 Wybierz...instruction to transfer control to the task initialize the

3. stack, fill the first frame memory allocation if this is the first task of the program filling in the descriptor in the kernel

Odpowiedź 4 Pytanie 48 Wybierz...instruction to transfer control to the task initialize the

4. stack, fill the first frame memory allocation if this is the first task of the program filling in the descriptor in the kernel

Informacja zwrotna

Twoja odpowiedź jest poprawna.

Poprawna odpowiedź to: 1. → filling in the descriptor in the kernel, 2. → memory allocation if this is the first task of the program, 3. → initialize the stack, fill the first frame, 4. → instruction to transfer control to the task

**Pytanie 49**

Niepoprawnie

Punkty: 0,00 z 1,00

Oflaguj pytanie

**Treść pytania**

A multiprogram system is one that, in principle:

Pytanie 49 Wybierz wszystkie poprawne:

- a.  
Requires relocation or equivalent mechanism
- b.  
It allows for running programs only one after another
- c.  
It allows for storing many programs in primary memory
- d.  
Requires dynamic relocation

**Informacja zwrotna**

Twoja odpowiedź jest niepoprawna.

Prawidłowymi odpowiedziami są: It allows for storing many programs in primary memory, Requires relocation or equivalent mechanism

**Pytanie 50**

Poprawnie

Punkty: 1,00 z 1,00

Oflaguj pytanie

**Treść pytania**

The common allocation queue to fixed blocks of memory of different sizes causes:

Pytanie 50 Wybierz wszystkie poprawne:

- a.  
need for compaction
- b.  
external fragmentation
- c.  
internal fragmentation

**Informacja zwrotna**

Twoja odpowiedź jest poprawna.

Prawidłowymi odpowiedziami są: internal fragmentation, external fragmentation

**Pytanie 51**

Niepoprawnie

Punkty: 0,00 z 1,00

Oflaguj pytanie

**Treść pytania**

The behavior of the exchange algorithm opposite to that expected with the measures taken is called:

Odpowiedź: Pytanie 51

**Informacja zwrotna**

Poprawna odpowiedź to: anomaly

**Pytanie 52**

Poprawnie

Punkty: 1,00 z 1,00

Oflaguj pytanie

**Treść pytania**

If the compiler prepares a program with absolute addresses to be loaded in a fixed address space, it is called:

Pytanie 52 Odpowiedź

- a.  
Static compiling
- b.  
Dynamic compiling
- c.  
Static relocation
- d.  
Dynamic relocation

**Informacja zwrotna**

Poprawna odpowiedź to: Static relocation

**Pytanie 53**

Poprawnie

Punkty: 1,00 z 1,00

Oflaguj pytanie

**Treść pytania**

During the interrupt handling:

Pytanie 53 Wybierz wszystkie poprawne:

- a.  
other interrupts can be accepted
- b.  
other interrupts may or may not be accepted at the discretion of the programmer
- c.  
other interrupts are disabled

**Informacja zwrotna**

Twoja odpowiedź jest poprawna.

Poprawna odpowiedź to: other interrupts may or may not be accepted at the discretion of the programmer

**Pytanie 54**

Poprawnie

Punkty: 1,00 z 1,00

Oflaguj pytanie

**Treść pytania**

Scheduling aims to optimize:

Pytanie 54 Wybierz wszystkie poprawne:

- a.  
wait time
- b.  
reaction time
- c.  
processor utilization
- d.  
system throughput

#### Informacja zwrotna

Twoja odpowiedź jest poprawna.

Prawidłowymi odpowiedziami są: processor utilization, system throughput, wait time, reaction time

### Pytanie 55

Poprawnie

Punkty: 1,00 z 1,00

Oflaguj pytanie

#### Treść pytania

The page index table address is stored in:

Pytanie 55 Wybierz wszystkie poprawne:

- a.  
page register
- b.  
stack pointer
- c.  
program counter
- d.  
page table base register

#### Informacja zwrotna

Twoja odpowiedź jest poprawna.

Poprawna odpowiedź to: page table base register

### Pytanie 56

Poprawnie

Punkty: 1,00 z 1,00

Oflaguj pytanie

#### Treść pytania

The file system layer plays the following role in the operating system:

Pytanie 56 Wybierz wszystkie poprawne:

- a.  
It runs programs stored in files
- b.  
Controls file access rights
- c.

- It performs directory services in the hierarchy of disk files
- d.
- Performs file opening and closing operations

Informacja zwrotna  
Twoja odpowiedź jest poprawna.

Prawidłowymi odpowiedziami są: Performs file opening and closing operations, It performs directory services in the hierarchy of disk files, Controls file access rights

**Pytanie 57**

Niepoprawnie

Punkty: 0,00 z 1,00

Oflaguj pytanie

Treść pytania

The algorithm in which the most recently loaded page is swapped out is called (enter the abbreviation if applicable):

Odpowiedź: Pytanie 57

Informacja zwrotna

Poprawna odpowiedź to: FIFO

**Pytanie 58**

Poprawnie

Punkty: 1,00 z 1,00

Oflaguj pytanie

Treść pytania

In which swapping algorithms is the M bit value used?

Pytanie 58 Wybierz wszystkie poprawne:

- a.  
working set
- b.  
no algorithm
- c.  
LFU
- d.  
clock
- e.  
FIFO
- f.  
NRU
- g.  
LRU
- h.  
optimal

i.  
second chance

Informacja zwrotna  
Twoja odpowiedź jest poprawna.  
Poprawna odpowiedź to: NRU

Pytanie **59**

Poprawnie

Punkty: 1,00 z 1,00

Oflaguj pytanie

Treść pytania

Using Test-And-Set or Compare-And-Swap in synchronization:

Pytanie 59 Wybierz wszystkie poprawne:

- a.  
It can only be applied in systems with shared memory
- b.  
Requires organizing inactive waiting in queues
- c.  
It requires processes to actively wait
- d.  
Stops the processor if 0 is read

Informacja zwrotna

Twoja odpowiedź jest poprawna.

Prawidłowymi odpowiedziami są: It requires processes to actively wait,  
It can only be applied in systems with shared memory

Pytanie **60**

Niepoprawnie

Punkty: 0,00 z 1,00

Oflaguj pytanie

Treść pytania

Memory partitioning into blocks of any size:

Pytanie 60 Wybierz wszystkie poprawne:

- a.  
It does not imply fragmentation
- b.  
It implies external fragmentation
- c.  
It implies internal fragmentation

Informacja zwrotna

Twoja odpowiedź jest niepoprawna.

Poprawna odpowiedź to: It does not imply fragmentation

Pytanie **61**

Poprawnie

Punkty: 5,00 z 5,00

Oflaguj pytanie

### Treść pytania

What is the average time in the system for tasks in the batch, using SJF algorithm?

The system is equipped with 3 processors

task	1	2	3	4
processing time	3,4	5,7	2,8	1,3

Odpowiedź:Pytanie 61

Informacja zwrotna

Poprawna odpowiedź to: 3,6

### Pytanie 62

Poprawnie

Punkty: 5,00 z 5,00

Oflaguj pytanie

### Treść pytania

In RAID 4, data is placed in Strips that are "scattered" over the data disks, so that each subsequent strip is on the next data disk, modulo the number of disks. For this, there is a parity disk that holds the parity bits of zeroth bits, first bits, second bits, etc., equal-numbered strips divided by the number of data disks, for example, strips 0-3, 4-7, 8-11, etc.:

the start of strips 0,1,2,3 looks like this:

1	1	1	0	0	Parity disk
1	1	1	1	1	Disk 3
1	0	0	1	0	Disk 2
1	0	1	0	1	Disk 1
0	1	1	0	0	Disk 0

In the parity strip, the values are placed so that the parity bit keeps the corresponding strip bits 0-3 even.

Disk 3 has been corrupted and always reads 1. After replacing the disk with a new one, what values should I put in the strip on disk 3?

Odpowiedź:Pytanie 62

Informacja zwrotna

Poprawna odpowiedź to: 10111

### Pytanie 63

Poprawnie

Punkty: 5,00 z 5,00

Oflaguj pytanie

Treść pytania

The virtual address consists of 8b page number and 8b offset. The page index table is shown below (index, content). For decimal address 1432, binary 0000 0101 1001 1000, enter the physical address in the form: frame number.offset (as decimal numbers, offset in 3 digits). For example, for a physical address consisting of frame 0 and offset 18, specify 0.018. If there is no physical address for the given virtual address, then -1 should be specified.

7	-1
6	5
5	7
4	11
3	-1
2	9
1	2
0	1

Odpowiedź: Pytanie 63

Informacja zwrotna

Poprawna odpowiedź to: 7,152

**Question 1**

Correct

Mark 1.00 out of 1.00

[Flag question](#)**Question text**

The page fault interrupt is used to:

Question 1 Select one or more:

a.

Detection of an attempt to write outside the address space of the frame

b.

Whether the frame is empty or contains a page

c.

Downloads to the memory of the requested page

d.

Detection of an access attempt from a frame not allocated to the program

**Feedback**

Twoja odpowiedź jest poprawna.

The correct answer is: Downloads to the memory of the requested page

**Question 2**

Incorrect

Mark 0.00 out of 1.00

[Flag question](#)**Question text**

The following situations trigger "error" exceptions:

Question 2 Select one or more:

a.

memory reference in the area of the page that is not in memory

b.

memory reference beyond limit register value

c.

a reference to memory that is not in the program address space

d.

an attempt to execute an instruction from the area of the page for which the "no code" bit was set

**Feedback**

Twoja odpowiedź jest niepoprawna.

The correct answers are: a reference to memory that is not in the program address space, memory reference beyond limit register value, an attempt to execute an instruction from the area of the page for which the "no code" bit was set

**Question 3**

Incorrect

Mark 0.00 out of 1.00

[Flag question](#)

**Question text**

Which of the following information is stored on task switching?

**Question 3Answer**

- a. Contents of the instruction register and similar registers
- b. contents of general purpose registers, program counter, and similar registers available to the program
- c. scheduler data
- d. I/O status information

**Feedback**

The correct answers are: I/O status information, scheduler data, contents of general purpose registers, program counter, and similar registers available to the program

**Question 4**

Correct

Mark 1.00 out of 1.00

[Flag question](#)

**Question text**

What can happen when a job leaves the critical section and more than 1 task is waiting for the critical section?

**Question 4Select one or more:**

- a. starvation awaiting a critical section
- b. letting both tasks into the critical section
- c. deadlock waiting for critical section
- d.

active waiting for a critical section

**Feedback**

Twoja odpowiedź jest poprawna.

The correct answer is: starvation awaiting a critical section

**Question 5**

Incorrect

Mark 0.00 out of 1.00

[Flag question](#)

**Question text**

The root directory of the disk should be located:

Question 5Answer

a.

in a place hard-coded in the structures of the operating system

b.

in a permanent place on the disk

c.

at a fixed address in main memory

d.

in a place designated by the data structure in a fixed location on the disk

**Feedback**

The correct answer is: in a place designated by the data structure in a fixed location on the disk

**Question 6**

Correct

Mark 1.00 out of 1.00

[Flag question](#)

**Question text**

Which of the following information is stored on task switching?

Question 6Answer

a.

Contents of datum, limit and other registers inaccessible to the program

b.

Contents of general purpose registers, program counter, and similar registers available to the program

c.

I/O status information

d.

scheduler data

**Feedback**

The correct answers are: I/O status information, scheduler data, Contents of datum, limit and other registers inaccessible to the program, Contents of general purpose registers, program counter, and similar registers available to the program

**Question 7**

Incorrect

Mark 0.00 out of 1.00

[Flag question](#)

**Question text**

What mechanism is part of time-sharing systems?

**Question 7 Answer**

- a.  
medium-level scheduler
- b.  
low-level scheduler
- c.  
swapping
- d.  
high-level scheduler

**Feedback**

The correct answer is: low-level scheduler

**Question 8**

Incorrect

Mark 0.00 out of 1.00

[Flag question](#)

**Question text**

In a FAT-based disk system, file size is directly limited by:

**Question 8 Select one or more:**

- a.  
The number of bits of the disk address
- b.  
The number of bits of the field describing the size of the file
- c.  
The size of the disk space
- d.  
FAT table size

e.

Allocation unit size

**Feedback**

Twoja odpowiedź jest niepoprawna.

The correct answers are: The size of the disk space, The number of bits of the field describing the size of the file

**Question 9**

Incorrect

Mark 0.00 out of 1.00

[Flag question](#)

**Question text**

Which technique was introduced because a single task could occupy both the CPU and I/O devices?

Question 9Select one or more:

a.

Buffering

b.

Multiprogramming

c.

Preemptive scheduling

d.

Interrupts

**Feedback**

Twoja odpowiedź jest niepoprawna.

The correct answer is: Interrupts

**Question 10**

Correct

Mark 1.00 out of 1.00

[Flag question](#)

**Question text**

Individual interrupt mask:

Question 10Select one or more:

a.

register in which addresses of devices reporting individual interrupts are stored

b.

a combinational circuit that calculates the number of the interrupt received

- c.  
a register whose bits are ORed (alternative) with the bits from the interrupt request register  
d.  
a register whose bits are ANDed (conjunction) with the bits from the interrupt request register

**Feedback**

Twoja odpowiedź jest poprawna.

The correct answer is: a register whose bits are ANDed (conjunction) with the bits from the interrupt request register

**Question 11**

Incorrect

Mark 0.00 out of 1.00

[Flag question](#)

**Question text**

Which swapping algorithms use the current time slice number?

Question 11Select one or more:

- a.  
FIFO
- b.  
LRU
- c.  
no algorithm
- d.  
clock
- e.  
working set
- f.  
LFU
- g.  
optimal
- h.  
second chance
- i.  
NRU

**Feedback**

Twoja odpowiedź jest niepoprawna.

The correct answers are: second chance, working set

**Question 12**

Incorrect

Mark 0.00 out of 1.00

[Flag question](#)**Question text**

Paging - two-level index tables mode of operation

Question 12Select one or more:

- a.  
The content of a level 1 table element points to a level 2 table
- b.  
The content of a level 1 table element is an index in a level 2 table
- c.  
The content of a level 1 table element points to a level 2 table
- d.  
The content of the level 1 table element is concatenated (combined) with the content of the level 2 table element

**Feedback**

Twoja odpowiedź jest niepoprawna.

The correct answer is: The content of a level 1 table element points to a level 2 table

**Question 13**

Correct

Mark 1.00 out of 1.00

[Flag question](#)**Question text**

What is a scheduler?

Question 13Select one or more:

- a.  
the system process that allocates the processor
- b.  
memory allocation procedure
- c.  
a kernel routine that selects a task to execute
- d.  
procedure that schedules frame release in the page replace algorithm

**Feedback**

Twoja odpowiedź jest poprawna.

The correct answer is: a kernel routine that selects a task to execute

**Question 14**

Correct

Mark 1.00 out of 1.00

[Flag question](#)

**Question text**

In indulgent scheduling, the process keeps the CPU until:

Question 14 Select one or more:

- a.  
termination
- b.  
waiving
- c.  
next interrupt from the device
- d.  
next interrupt from the timer

**Feedback**

Twoja odpowiedź jest poprawna.

The correct answers are: waiving, termination

**Question 15**

Partially correct

Mark 0.50 out of 1.00

[Flag question](#)

**Question text**

How does the operating system call the task completion subroutine?

- Answer 1 Question 15 Choose...recreates the context programmatically and executes the IRET  
2. instruction sets the trace in the terminating subroutine to the current position  
builds the frame of the terminating subroutine on the task stack  
builds an interrupt vector on the system stack  
pointing to the terminating subroutine code

- Answer 2 Question 15 Choose...recreates the context programmatically and executes the IRET  
4. instruction sets the trace in the terminating subroutine to the current position  
builds the frame of the terminating subroutine on the task stack  
builds an interrupt vector on the system stack  
pointing to the terminating subroutine code

- Answer 3 Question 15 Choose...recreates the context programmatically and executes the IRET  
3. instruction sets the trace in the terminating subroutine to the current position  
builds the frame of the terminating subroutine on the task stack  
builds an interrupt vector on the system stack  
pointing to the terminating subroutine code

1. Answer 4 Question 15 Choose...recreates the context programmatically and executes the IRET

instruction sets the trace in the terminating subroutine to the current position  
builds the frame of the terminating subroutine on the task stack  
builds an interrupt vector on the system stack  
pointing to the terminating subroutine code

### Feedback

Twoja odpowiedź jest częściowo poprawna.

You have correctly selected 2.

The correct answer is: 2. → sets the trace in the terminating subroutine to the current position, 4. → recreates the context programmatically and executes the IRET instruction, 3. → builds an interrupt vector on the system stack pointing to the terminating subroutine code, 1. → builds the frame of the terminating subroutine on the task stack

### Question 16

Correct

Mark 1.00 out of 1.00

Flag question

### Question text

Two successive executions of operation V in one process on a binary semaphore in down state:

Question 16 Select one or more:

- a.  
Raises the semaphore if there are no suspended processes
- b.  
Increases semaphore value by 2
- c.  
It doesn't change anything
- d.  
If the semaphore guards a critical region, it can let two processes enter the critical region

### Feedback

Twoja odpowiedź jest poprawna.

The correct answers are: If the semaphore guards a critical region, it can let two processes enter the critical region, Raises the semaphore if there are no suspended processes

### Question 17

Correct

Mark 1.00 out of 1.00

Flag question

### Question text

What does the kernel do when there is no task (process) to run?

Question 17 Select one or more:

- a.  
resets the entire system
- b.  
executes an infinite loop in the kernel until a task arrives
- c.  
starts the idle task
- d.  
switches off the power supply

#### Feedback

Twoja odpowiedź jest poprawna.

The correct answer is: starts the idle task

#### Question 18

Incorrect

Mark 0.00 out of 1.00

Flag question

#### Question text

Address translation mechanism:

Question 18Select one or more:

- a.  
concatenates the frame number and page number
- b.  
concatenates the frame number and offset on the page
- c.  
adds the frame number to the page number
- d.  
concatenates the page number and page offset

#### Feedback

Twoja odpowiedź jest niepoprawna.

The correct answer is: concatenates the frame number and offset on the page

#### Question 19

Incorrect

Mark 0.00 out of 1.00

Flag question

#### Question text

Physical address:

Question 19Select one or more:

- a.  
indicates a relative address to the segment register
- b.  
points to a location in the address space of primary memory
- c.  
points to a cell in the process address space
- d.  
is contained in the address field of the instruction

**Feedback**

Twoja odpowiedź jest niepoprawna.

The correct answer is: points to a location in the address space of primary memory

**Question 20**

Correct

Mark 1.00 out of 1.00

[Flag question](#)

**Question text**

The operating system plays the following role in a computer system:

Question 20 Select one or more:

- a.  
relational database management
- b.  
computer system resource management
- c.  
compiling and running programs
- d.  
Create a concurrent environment

**Feedback**

Twoja odpowiedź jest poprawna.

The correct answers are: Create a concurrent environment, computer system resource management

**Question 21**

Correct

Mark 1.00 out of 1.00

[Flag question](#)

**Question text**

MMU uses index tables to:

Question 21Select one or more:

- a.  
generate a relative address
- b.  
generate a physical address
- c.  
generate an effective address
- d.  
generate a logical address

**Feedback**

Twoja odpowiedź jest poprawna.

The correct answer is: generate a physical address

Question 22

Correct

Mark 1.00 out of 1.00

[Flag question](#)

**Question text**

What mechanism is used to save and restore the task state?

Question 22Answer

- a.  
context switch
- b.  
task descriptor
- c.  
scheduling data
- d.  
applications counter

**Feedback**

The correct answer is: context switch

Question 23

Correct

Mark 1.00 out of 1.00

[Flag question](#)

**Question text**

Discontinuous allocation is the result of:

Question 23Select one or more:

- a.  
segmantation
- b.  
paging
- c.  
relocation
- d.  
compaction

#### Feedback

Twoja odpowiedź jest poprawna.

The correct answers are: paging, segmantation

#### Question 24

Correct

Mark 1.00 out of 1.00

Flag question

#### Question text

Internal fragmentation consists in:

Question 24 Select one or more:

- a.  
Discontinuous program memory allocation
- b.  
The program does not use all the memory allocated to it
- c.  
Dividing the memory allocated to the program into a data area and a code area
- d.  
Free memory blocks between allocated blocks

#### Feedback

Twoja odpowiedź jest poprawna.

The correct answer is: The program does not use all the memory allocated to it

#### Question 25

Incorrect

Mark 0.00 out of 1.00

Flag question

#### Question text

The following paging exceptions allow for returning to the program after they occur:

Question 25 Select one or more:

- a.  
interrupt on write (IOW)
- b.  
page fault
- c.  
attempting to write to a write-protected frame
- d.  
attempt to read from the frame storing the code

**Feedback**

Twoja odpowiedź jest niepoprawna.

The correct answers are: page fault, interrupt on write (IOW)

**Question 26**

Correct

Mark 1.00 out of 1.00

Flag question

**Question text**

Static relocation is performed by:

**Question 26Answer**

- a.  
Special registers (LIMIT)
- b.  
Paging system
- c.  
Segment descriptors
- d.  
Loader

**Feedback**

The correct answer is: Loader

**Question 27**

Incorrect

Mark 0.00 out of 1.00

Flag question

**Question text**

For address translation, the following is used:

**Question 27Select one or more:**

- a.

- index table
- b.  
reference and protection bits
- c.  
translation register
- d.  
associative translation buffer

**Feedback**

Twoja odpowiedź jest niepoprawna.

The correct answers are: index table, associative translation buffer

**Question 28**

Partially correct

Mark 0.50 out of 1.00

[Flag question](#)

**Question text**

Static relocation is performed by:

**Question 28Answer**

a.

Segment descriptors

b.

Paging system

c.

Linker

d.

Compiler

**Feedback**

The correct answers are: Compiler, Linker

**Question 29**

Correct

Mark 1.00 out of 1.00

[Flag question](#)

**Question text**

In UNIX, access rights are specified:

**Question 29Select one or more:**

a.

At the same time, for all files in a given directory owned by the user

- b.  
Individually for each file
- c.  
Separately for write, read and execute/search
- d.  
Separately for the user, the group to which the user belongs and for all others

#### Feedback

Twoja odpowiedź jest poprawna.

The correct answers are: Individually for each file, Separately for the user, the group to which the user belongs and for all others, Separately for write, read and execute/search

#### Question 30

Correct

Mark 1.00 out of 1.00

Flag question

#### Question text

Calling the program with the "exec" operation results in (accurately to the result of the exec operation):

Question 30Select one or more:

- a.  
Loading a code segment from disk, duplicating the data segment of the calling process
- b.  
Loading code and data segments from disk, initializing a new stack segment
- c.  
Loading a code segment from disk, duplicating data segments and the calling process stack

#### Feedback

Twoja odpowiedź jest poprawna.

The correct answer is: Loading code and data segments from disk, initializing a new stack segment

#### Question 31

Correct

Mark 1.00 out of 1.00

Flag question

#### Question text

Scheduler function is:

Question 31Answer

- a.  
selecting a task to run
- b.  
scheduling tasks on the processor
- c.  
counting the CPU time used by tasks
- d.  
changing task priorities

#### Feedback

The correct answer is: selecting a task to run

#### Question 32

Correct

Mark 1.00 out of 1.00

Flag question

#### Question text

In the philosophers problem, if there are 4 of them:

Question 32Select one or more:

- a.  
Starvation is possible
- b.  
Deadlock is possible
- c.  
Deadlock is not possible
- d.  
Starvation is not possible

#### Feedback

Twoja odpowiedź jest poprawna.

The correct answers are: Deadlock is possible, Starvation is not possible

#### Question 33

Correct

Mark 1.00 out of 1.00

Flag question

#### Question text

The kernel (microkernel) is responsible for:

Question 33Select one or more:

- a.  
memory allocation and freeing
- b.  
synchronization of processes and devices with processes
- c.  
interrupt handling (at the elementary level, then they are passed on to other layers).
- d.  
task control

#### Feedback

Twoja odpowiedź jest poprawna.

The correct answers are: task control, synchronization of processes and devices with processes, interrupt handling (at the elementary level, then they are passed on to other layers).

#### Question 34

Correct

Mark 1.00 out of 1.00

[Flag question](#)

#### Question text

The software resources of a computer system are:

Question 34 Select one or more:

- a.  
Primary memory
- b.  
Files
- c.  
Semaphores
- d.  
Buffers

#### Feedback

Twoja odpowiedź jest poprawna.

The correct answers are: Files, Buffers, Semaphores

#### Question 35

Partially correct

Mark 0.50 out of 1.00

[Flag question](#)

#### Question text

Which of the following memory allocation schemes causes external fragmentation?

Question 35Answer

- a.  
Sweeping
- b.  
Multiple contiguous fixed partitions of equal size
- c.  
Multiple contiguous fixed partitions of various sizes
- d.  
Paging

Feedback

The correct answers are: Sweeping, Multiple contiguous fixed partitions of various sizes

Question 36

Correct

Mark 1.00 out of 1.00

Flag question

Question text

Dynamic relocation is performed by:

Question 36Answer

- a.  
Special registers (DATUM)
- b.  
Loader
- c.  
Linker
- d.  
Compiler

Feedback

The correct answer is: Special registers (DATUM)

Question 37

Incorrect

Mark 0.00 out of 1.00

Flag question

Question text

Can the exchange algorithm: selecting a frame to empty and loading a new page, be performed in user mode?

Question 37Answer

True

False

Feedback

The correct answer is 'True'.

Question 38

Correct

Mark 1.00 out of 1.00

Flag question

Question text

To end the interrupt service, use the following instruction:

Question 38Select one or more:

- a.  
regular jump instruction
- b.  
special return instruction
- c.  
none - the processor will end the service automatically
- d.  
return from subroutine call

Feedback

Twoja odpowiedź jest poprawna.

The correct answer is: special return instruction

Question 39

Correct

Mark 1.00 out of 1.00

Flag question

Question text

Using the Test-And-Set instruction in synchronization:

Question 39Select one or more:

- a.  
Stops the processor if 0 is read
- b.  
Requires organizing inactive waiting in queues
- c.  
It requires processes to actively wait

Feedback

Twoja odpowiedź jest poprawna.

The correct answer is: It requires processes to actively wait

**Question 40**

Correct

Mark 1.00 out of 1.00

Flag question

**Question text**

The Test-And-Set or Compare-And-Swap instruction has the following characteristics:

Question 40Select one or more:

a.

Requires active waiting from tasks

b.

It is possible to deadlock with TAS/CAS operations on multiple variables

c.

It is possible to use only on computers with common memory

d.

It is possible to use only in 1-processor systems

**Feedback**

Twoja odpowiedź jest poprawna.

The correct answers are: Requires active waiting from tasks, It is possible to use only on computers with common memory, It is possible to deadlock with TAS/CAS operations on multiple variables

**Question 41**

Correct

Mark 1.00 out of 1.00

Flag question

**Question text**

Interrupt mask:

Question 41Select one or more:

a.

must be part of the status register

b.

can unblock interrupts when the interrupt handler completes

c.

causes interrupts to be disabled when an interrupt is accepted

d.

can be set and reset by special processor instructions

### Feedback

Twoja odpowiedź jest poprawna.

The correct answers are: causes interrupts to be disabled when an interrupt is accepted, can unblock interrupts when the interrupt handler completes, can be set and reset by special processor instructions

### Question 42

Incorrect

Mark 0.00 out of 1.00

[Flag question](#)

### Question text

Allocation unit for file storage:

#### Question 42Answer

- a.  
must be constant across the disk partition
- b.  
may be a variable in a partition
- c.  
may differ between files on a partition
- d.  
It should be selected to match the characteristics of the data

### Feedback

The correct answer is: must be constant across the disk partition

### Question 43

Incorrect

Mark 0.00 out of 1.00

[Flag question](#)

### Question text

Allocation unit for storing files:

#### Question 43Answer

- a.  
may vary between partitions
- b.  
may differ between files in a partition
- c.  
must be constant across the disk partition
- d.  
it should be selected to match the characteristics of the data

### Feedback

The correct answers are: must be constant across the disk partition, may vary between partitions

#### Question 44

Incorrect

Mark 0.00 out of 1.00

Flag question

### Question text

Which swapping algorithms use page reference history?

Question 44Select one or more:

- a.  
NRU
- b.  
LRU
- c.  
FIFO
- d.  
working set
- e.  
working set clock
- f.  
LFU
- g.  
second chance

### Feedback

Twoja odpowiedź jest niepoprawna.

The correct answers are: LRU, LFU

#### Question 45

Correct

Mark 1.00 out of 1.00

Flag question

### Question text

What type of code can multiple processes execute simultaneously?

Question 45Select one or more:

- a.  
dynamically relocated
- b.

reentrant

- c.  
binary
- d.  
self-modifying

**Feedback**

Twoja odpowiedź jest poprawna.

The correct answer is: reentrant

**Question 46**

Correct

Mark 1.00 out of 1.00

Flag question

**Question text**

The thread is also called:

**Question 46Answer**

- a.  
overlay process
- b.  
lightweight process
- c.  
heavy process
- d.  
data process

**Feedback**

The correct answer is: lightweight process

**Question 47**

Correct

Mark 1.00 out of 1.00

Flag question

**Question text**

Round-robin scheduling is the best mechanism for:

**Question 47Select one or more:**

- a.  
time-sharing system
- b.  
real-time system

- c. system with different classes of tasks
- d. every system

**Feedback**

Twoja odpowiedź jest poprawna.

The correct answer is: time-sharing system

**Question 48**

Correct

Mark 1.00 out of 1.00

[Flag question](#)

**Question text**

Context switch is:

Question 48Select one or more:

- a. calling the kernel of the operating system
- b. switching to the system stack
- c. extracode execution
- d. writing registers to the task stack and retrieving them from another task stack

**Feedback**

Twoja odpowiedź jest poprawna.

The correct answer is: writing registers to the task stack and retrieving them from another task stack

**Question 49**

Correct

Mark 1.00 out of 1.00

[Flag question](#)

**Question text**

The following situations cause the exceptions (processor internal interrupts) of the "error" type:

Question 49Select one or more:

- a. memory reference beyond limit register value
- b.

an attempt to write to the page for which the "read only" bit is set

- c. memory reference in the area of the page that is not in memory
- d. a reference to memory that is not in the address space

#### Feedback

Twoja odpowiedź jest poprawna.

The correct answers are: a reference to memory that is not in the address space, memory reference beyond limit register value, an attempt to write to the page for which the "read only" bit is set

#### Question 50

Correct

Mark 1.00 out of 1.00

[Flag question](#)

#### Question text

A memory management technique in which the system divides memory into equal-sized portions to easily manage relocation is called:

Question 50 Select one or more:

- a. sweeping
- b. paging
- c. swapping
- d. mapping

#### Feedback

Twoja odpowiedź jest poprawna.

The correct answer is: paging

#### Question 51

Partially correct

Mark 0.50 out of 1.00

[Flag question](#)

#### Question text

Separate allocation queues for fixed memory blocks of equal size cause:

Question 51 Select one or more:

- a.  
need for compaction
- b.  
internal fragmentation
- c.  
external fragmentation

#### Feedback

Twoja odpowiedź jest częściowo poprawna.

You have correctly selected 1.

The correct answers are: internal fragmentation, external fragmentation

#### Question 52

Incorrect

Mark 0.00 out of 1.00

Flag question

#### Question text

A multiuser system is one that, in principle:

Question 52Select one or more:

- a.  
Requires the use of timer interrupts
- b.  
Must be multi-threaded
- c.  
Allows multiple processes to actually run simultaneously
- d.  
Must be concurrent

#### Feedback

Twoja odpowiedź jest niepoprawna.

The correct answers are: Must be concurrent, Requires the use of timer interrupts

#### Question 53

Incorrect

Mark 0.00 out of 1.00

Flag question

#### Question text

In which swapping algorithms is it necessary to collectively clear the M-bits?

Question 53Select one or more:

- a.

no algorithm

- b.  
clock
- c.  
FIFO
- d.  
NRU
- e.  
working set
- f.  
LFU
- g.  
second chance
- h.  
LRU
- i.  
working set clock

#### Feedback

Twoja odpowiedź jest niepoprawna.

The correct answer is:

no algorithm

#### Question 54

Correct

Mark 1.00 out of 1.00

[Flag question](#)

#### Question text

Interrupt request register is:

Question 54 Select one or more:

- a.  
a register that blocks or unblocks all interrupts
- b.  
a combinational circuit that calculates the number of the interrupt received
- c.  
a register where interrupt line states are stored
- d.  
a register that blocks or unblocks individual interrupts

### Feedback

Twoja odpowiedź jest poprawna.

The correct answer is: a register where interrupt line states are stored

### Question 55

Partially correct

Mark 0.50 out of 1.00

[Flag question](#)

### Question text

The internal state of the file system layer is available for:

#### Question 55Answer

- a.  
OS kernel
- b.  
Program supervisor layer
- c.  
User programs
- d.  
Applications

### Feedback

The correct answers are: OS kernel, Program supervisor layer

### Question 56

Correct

Mark 1.00 out of 1.00

[Flag question](#)

### Question text

"Soft" real-time system:

#### Question 56Select one or more:

- a.  
Guaranteed response time
- b.  
Guarantees average response time
- c.  
Guarantees interrupt handling time

### Feedback

Twoja odpowiedź jest poprawna.

The correct answer is: Guarantees average response time

**Question 57**

Correct

Mark 1.00 out of 1.00

[Flag question](#)**Question text**

At the suspended state is a process that:

Question 57Select one or more:

- a.  
waits for an I/O operation to complete
- b.  
fills the processor idle time
- c.  
waits for a processor
- d.  
occupies a processor

**Feedback**

Twoja odpowiedź jest poprawna.

The correct answer is: waits for an I/O operation to complete

**Question 58**

Correct

Mark 1.00 out of 1.00

[Flag question](#)**Question text**

Processor access scheduling decisions may be made under which of the following circumstances?

Question 58Select one or more:

- a.  
When a task goes from the waiting state to the ready state
- b.  
When a task transitions from the active state to the ready state
- c.  
When a task terminates
- d.  
When a task goes from the active state to the waiting state

**Feedback**

Twoja odpowiedź jest poprawna.

The correct answers are: When a task goes from the active state to the waiting state, When a task transitions from the active state to the ready state, When a task goes from the waiting state to the ready state, When a task terminates

**Question 59**

Correct

Mark 1.00 out of 1.00

Flag question

**Question text**

The key in associative memory is:

Question 59Select one or more:

- a.  
Frame number
- b.  
The frame number concatenated with the page number
- c.  
Page number
- d.  
The page number concatenated with the frame number

**Feedback**

Twoja odpowiedź jest poprawna.

The correct answer is: Page number

**Question 60**

Incorrect

Mark 0.00 out of 1.00

Flag question

**Question text**

The sweeping mechanism consists in:

Question 60Select one or more:

- a.  
Loading segments into primary memory and sending them to disk
- b.  
Moving programs around in memory to eliminate fragmentation
- c.  
Merging adjacent free memory blocks
- d.  
Loading pages into the primary memory and sending them to the disk

### Feedback

Twoja odpowiedź jest niepoprawna.

The correct answer is: Loading segments into primary memory and sending them to disk

### Question 61

Correct

Mark 5.00 out of 5.00

Flag question

### Question text

What is the average time in the system for tasks in the batch, using SJF algorithm?

The system is equipped with 3 processors

task	1	2	3	4
processing time	3.3	5.2	2.3	1.5

Answer: Question 61

### Feedback

The correct answer is: 3.5

### Question 62

Incorrect

Mark 0.00 out of 5.00

Flag question

### Question text

In RAID 4, data is placed in Strips that are "scattered" over the data disks, so that each subsequent strip is on the next data disk, modulo the number of disks. For this, there is a parity disk that holds the parity bits of zeroth bits, first bits, second bits, etc., equal-numbered strips divided by the number of data disks, for example, strips 0-3, 4-7, 8-11, etc.:

the start of strips 0,1,2,3 looks like this:

1	1	1	0	0	Parity disk
0	0	0	0	0	Disk 3
1	0	0	1	0	Disk 2
1	0	1	1	0	Disk 1
0	1	1	0	0	Disk 0

In the parity strip, the values are placed so that the parity bit keeps the corresponding strip bits 0-3 even.

Disk 3 has been damaged and reads only 0. After replacing the disk with a new one, what values should be put in the strip on disk 3?

Answer:Question 62

[Feedback](#)

The correct answer is: 10100

Question **63**

Correct

Mark 5.00 out of 5.00

[Flag question](#)

[Question text](#)

Assuming that memory cells are 1-byte, the page number in the address field is 11 bits, the offset is 12 bits, the frame number is 12 bits, and all entries in the TIS page index table are on a 2-byte word boundary, specify:

- the maximum size of the program's virtual memory in MB

Answer:Question 63

[Feedback](#)

The correct answer is: 8

<b>Started on</b>	Wednesday, 19 June 2024, 12:16 PM
<b>State</b>	Finished
<b>Completed on</b>	Wednesday, 19 June 2024, 2:15 PM
<b>Time taken</b>	1 hour 58 mins
<b>Marks</b>	39.42/75.00
<b>Grade</b>	21.02 out of 40.00 (52.56%)

#### Question 1

Correct

Mark 1.00 out of 1.00

The interrupt acceptance sequence consists of (in the sequence):

Select one or more:

- a. identification of the interrupt level, saving the interrupt vector, performing a jump with a trace according to the interrupt table ✓
- b. identification of the interrupt level, performing a jump according to the interrupt table, saving the interrupt vector
- c. identification of the interrupt level, performing a jump with the trace according to the interrupt table, saving the interrupt vector
- d. identification of the interrupt level, saving the interrupt vector, performing a jump according to the interrupt table

Twoja odpowiedź jest poprawna.

The correct answer is: identification of the interrupt level, saving the interrupt vector, performing a jump with a trace according to the interrupt table

#### Question 2

Correct

Mark 1.00 out of 1.00

Interrupt mask:

Select one or more:

- a. can unblock interrupts when the interrupt handler completes ✓
- b. causes interrupts to be disabled when an interrupt is accepted ✓
- c. must be part of the status register
- d. can be set and reset by special processor instructions ✓

Twoja odpowiedź jest poprawna.

The correct answers are: causes interrupts to be disabled when an interrupt is accepted, can unblock interrupts when the interrupt handler completes, can be set and reset by special processor instructions

**Question 3**

Correct

Mark 1.00 out of 1.00

Imprecise interrupts can be handled:

Select one or more:

- a. when new instructions are suspended to be fetched into the pipeline
- b. only when the program allows accepting interrupts
- c. after saving the full state of the pipeline ✓
- d. after clearing the pipeline from the instructions ✓

Twoja odpowiedź jest poprawna.

The correct answers are: after clearing the pipeline from the instructions, after saving the full state of the pipeline

**Question 4**

Correct

Mark 1.00 out of 1.00

What can happen when a job leaves the critical section and more than 1 task is waiting for the critical section?

Select one or more:

- a. active waiting for a critical section
- b. starvation awaiting a critical section ✓
- c. letting both tasks into the critical section
- d. deadlock waiting for critical section

Twoja odpowiedź jest poprawna.

The correct answer is: starvation awaiting a critical section

**Question 5**

Incorrect

Mark 0.00 out of 1.00

Separate allocation queues for fixed memory blocks of equal size cause:

Select one or more:

- a. need for compaction ✗
- b. external fragmentation
- c. internal fragmentation

Twoja odpowiedź jest niepoprawna.

The correct answers are: internal fragmentation, external fragmentation

**Question 6**

Correct

Mark 1.00 out of 1.00

Static relocation is performed by:

- a. Special registers (DATUM)
- b. Linker ✓
- c. Paging system
- d. Segment descriptors

The correct answer is: Linker

**Question 7**

Partially correct

Mark 0.50 out of 1.00

Logical address:

Select one or more:

- a. is converted to a physical address in the address translation mechanism ✓
- b. points to a location in the address space of primary memory
- c. points to a cell in the process address space
- d. is a relative address - relative to the program counter

Twoja odpowiedź jest częściowo poprawna.

You have correctly selected 1.

The correct answers are: points to a cell in the process address space, is converted to a physical address in the address translation mechanism

**Question 8**

Incorrect

Mark 0.00 out of 1.00

Virtual memory consists of:

Select one or more:

- a. primary memory and cache ✗
- b. cache memory and mass storage
- c. primary and mass memory
- d. primary memory and cloud storage

Twoja odpowiedź jest niepoprawna.

The correct answer is: primary and mass memory

**Question 9**

Partially correct

Mark 0.50 out of 1.00

For address translation, the following is used:

Select one or more:

- a. reference and protection bits
- b. index table ✓
- c. associative translation buffer
- d. translation register

Twoja odpowiedź jest częściowo poprawna.

You have correctly selected 1.

The correct answers are: index table, associative translation buffer

**Question 10**

Correct

Mark 1.00 out of 1.00

Conditional variables in a monitor

Select one or more:

- a. They are used to suspend processes that cannot run because the conditions for their continuation are not met ✓
- b. They guard access to the critical region of the monitor
- c. They are used to check whether the conditions for process continuation are met

Twoja odpowiedź jest poprawna.

The correct answer is: They are used to suspend processes that cannot run because the conditions for their continuation are not met

**Question 11**

Incorrect

Mark 0.00 out of 1.00

A multiprogram system is one that, in principle:

Select one or more:

- a. Allows for storing multiple programs in mass memory
- b. Allows for running programs only one after another
- c. It allows for storing many programs in the main memory
- d. Allows for running more than one program at the same time ✗

Twoja odpowiedź jest niepoprawna.

The correct answer is: It allows for storing many programs in the main memory

**Question 12**

Partially correct

Mark 0.50 out of 1.00

How does the operating system call the task completion subroutine?

- 2. sets the trace in the terminating subroutine to the current position ✓
- 1. builds an interrupt vector on the system stack pointing to the terminating subroutine code ✗
- 4. recreates the context programmatically and executes the IRET instruction ✓
- 3. builds the frame of the terminating subroutine on the task stack ✗

Twoja odpowiedź jest częściowo poprawna.

You have correctly selected 2.

The correct answer is: 2. → sets the trace in the terminating subroutine to the current position, 1. → builds the frame of the terminating subroutine on the task stack, 4. → recreates the context programmatically and executes the IRET instruction, 3. → builds an interrupt vector on the system stack pointing to the terminating subroutine code

**Question 13**

Incorrect

Mark 0.00 out of 1.00

The sweeping mechanism consists in:

Select one or more:

- a. Merging adjacent free memory blocks
- b. Moving programs around in memory to eliminate fragmentation
- c. Loading pages into the primary memory and sending them to the disk ✗
- d. Loading segments into primary memory and sending them to disk

Twoja odpowiedź jest niepoprawna.

The correct answer is: Loading segments into primary memory and sending them to disk

**Question 14**

Partially correct

Mark 0.50 out of 1.00

The hardware resources of a computer system are:

Select one or more:

- a. Peripheral devices ✓
- b. Processor time
- c. Virtual memory
- d. Windows on the screen

Twoja odpowiedź jest częściowo poprawna.

You have correctly selected 1.

The correct answers are: Processor time, Peripheral devices

**Question 15**

Incorrect

Mark 0.00 out of 1.00

In which swapping algorithms is it necessary to collectively clear the M-bits?

Select one or more:

- a. second chance
- b. clock
- c. working set clock
- d. FIFO
- e. no algorithm
- f. LRU ✗
- g. NRU ✗
- h. working set
- i. LFU ✗

Twoja odpowiedź jest niepoprawna.

The correct answer is:

no algorithm

**Question 16**

Correct

Mark 1.00 out of 1.00

The key in associative memory is:

Select one or more:

- a. The frame number concatenated with the page number
- b. The page number concatenated with the frame number
- c. Frame number
- d. Page number ✓

Twoja odpowiedź jest poprawna.

The correct answer is: Page number

**Question 17**

Partially correct

Mark 0.50 out of 1.00

The internal state of the file system layer is available for:

- a. OS kernel ✓
- b. Program supervisor layer
- c. Applications
- d. User programs

The correct answers are: OS kernel, Program supervisor layer

**Question 18**

Incorrect

Mark 0.00 out of 1.00

Dirty frame is:

Select one or more:

- a. candidate to be swapped first
- b. read-only frame, tried to be written to ✗
- c. modified
- d. execute-only frame, tried to be read

Twoja odpowiedź jest niepoprawna.

The correct answer is: modified

**Question 19**

Partially correct

Mark 0.33 out of 1.00

In UNIX, access rights are specified:

Select one or more:

- a. At the same time, for all files in a given directory owned by the user
- b. Individually for each file ✓
- c. Separately for write, read and execute/search
- d. Separately for the user, the group to which the user belongs and for all others

Twoja odpowiedź jest częściowo poprawna.

You have correctly selected 1.

The correct answers are: Individually for each file, Separately for the user, the group to which the user belongs and for all others, Separately for write, read and execute/search

**Question 20**

Incorrect

Mark 0.00 out of 1.00

The combination of paging and segmentation consists in:

Select one or more:

- a. identifying segments with pages ✗
- b. dividing pages into segments
- c. the use of a segment table or a pool of segment registers treated as an additional, superior level of paging
- d. Generating a "frame error" interrupt when the frame containing the page does not belong to the current segment

Twoja odpowiedź jest niepoprawna.

The correct answer is: the use of a segment table or a pool of segment registers treated as an additional, superior level of paging

**Question 21**

Correct

Mark 1.00 out of 1.00

Dynamic relocation requires the use of:

Select one or more:

- a. limit register
- b. program counter
- c. base register (DATUM) ✓
- d. status register

Twoja odpowiedź jest poprawna.

The correct answer is: base register (DATUM)

**Question 22**

Partially correct

Mark 0.50 out of 1.00

A multiprogram system is one that, in principle:

Select one or more:

- a. It allows for running programs only one after another
- b. It allows for storing many programs in primary memory ✓
- c. Requires dynamic relocation
- d. Requires relocation or equivalent mechanism

Twoja odpowiedź jest częściowo poprawna.

You have correctly selected 1.

The correct answers are: It allows for storing many programs in primary memory, Requires relocation or equivalent mechanism

**Question 23**

Correct

Mark 1.00 out of 1.00

Imprecise interrupts are:

Select one or more:

- a. unblocked in any state of the processor, not just between executions of instructions
- b. accepted in any state of the processor, not just between the execution of successive instructions ✓
- c. transferred in any state of the processor, not just between the execution of successive instructions
- d. issued in any state of the processor, not just between the execution of successive instructions

Twoja odpowiedź jest poprawna.

The correct answer is: accepted in any state of the processor, not just between the execution of successive instructions

**Question 24**

Incorrect

Mark 0.00 out of 1.00

Internal fragmentation can be removed by:

Select one or more:

- a. Movement of allocated blocks in memory
- b. Transferring allocated memory blocks to disk
- c. The use of the "onion" algorithm ✗
- d. Allocating unused portions of memory within blocks to other programs
- e. No response from the others

Twoja odpowiedź jest niepoprawna.

The correct answer is: No response from the others

**Question 25**

Incorrect

Mark 0.00 out of 1.00

The mechanism for moving programs between primary memory and mass storage is called:

- a. sweeping
- b. leaching
- c. leading out
- d. swapping ✗

The correct answer is: sweeping

**Question 26**

Correct

Mark 1.00 out of 1.00

Semaphore function is to:

- a. process scheduling
- b. memory management
- c. synchronize processes for better CPU utilization
- d. synchronize critical resources to prevent deadlock ✓

The correct answer is: synchronize critical resources to prevent deadlock

**Question 27**

Incorrect

Mark 0.00 out of 1.00

Between fork and exec operations, the following operations are performed:

Select one or more:

- a. Allocating the appropriate amount of memory for the program being started ✗
- b. Loading the program to be started into memory
- c. Opening the appropriate input/output files

Twoja odpowiedź jest niepoprawna.

The correct answer is: Opening the appropriate input/output files

**Question 28**

Correct

Mark 1.00 out of 1.00

"Soft" real-time system:

Select one or more:

- a. Guaranteed response time
- b. Guarantees interrupt handling time
- c. Guarantees average response time ✓

Twoja odpowiedź jest poprawna.

The correct answer is: Guarantees average response time

**Question 29**

Correct

Mark 1.00 out of 1.00

Context switch is:

Select one or more:

- a. extracode execution
- b. writing registers to the task stack and retrieving them from another task stack ✓
- c. calling the kernel of the operating system
- d. switching to the system stack

Twoja odpowiedź jest poprawna.

The correct answer is: writing registers to the task stack and retrieving them from another task stack

**Question 30**

Correct

Mark 1.00 out of 1.00

The kernel (microkernel) is responsible for:

Select one or more:

- a. interrupt handling (at the elementary level, then they are passed on to other layers). ✓
- b. task control ✓
- c. synchronization of processes and devices with processes ✓
- d. memory allocation and freeing

Twoja odpowiedź jest poprawna.

The correct answers are: task control, synchronization of processes and devices with processes, interrupt handling (at the elementary level, then they are passed on to other layers).

**Question 31**

Correct

Mark 1.00 out of 1.00

During the interrupt handling:

Select one or more:

- a. other interrupts are disabled
- b. other interrupts may or may not be accepted at the discretion of the programmer ✓
- c. other interrupts can be accepted

Twoja odpowiedź jest poprawna.

The correct answer is: other interrupts may or may not be accepted at the discretion of the programmer

**Question 32**

Incorrect

Mark 0.00 out of 1.00

The page fault interrupt is used to:

Select one or more:

- a. Downloads to the memory of the requested page
- b. Whether the frame is empty or contains a page
- c. Detection of an attempt to write outside the address space of the frame
- d. Detection of an access attempt from a frame not allocated to the program ✗

Twoja odpowiedź jest niepoprawna.

The correct answer is: Downloads to the memory of the requested page

**Question 33**

Partially correct

Mark 0.33 out of 1.00

The sweeping criteria include:

Select one or more:

- a. Segment referencing frequency
- b. Analysis of program execution history ✓
- c. Program state
- d. Priority

Twoja odpowiedź jest częściowo poprawna.

You have correctly selected 1.

The correct answers are: Priority, Program state, Analysis of program execution history

**Question 34**

Correct

Mark 1.00 out of 1.00

The page index table address is stored in:

Select one or more:

- a. segment base register
- b. page register
- c. page table base register ✓
- d. instruction pointer

Twoja odpowiedź jest poprawna.

The correct answer is: page table base register

**Question 35**

Correct

Mark 1.00 out of 1.00

The number of tasks performed on the system in a given time is:

Select one or more:

- a. response time
- b. efficiency
- c. utilization
- d. throughput ✓

Twoja odpowiedź jest poprawna.

The correct answer is: throughput

**Question 36**

Correct

Mark 1.00 out of 1.00

By definition, a deadlock is a situation where:

Select one or more:

- a. any greater than zero number of processes are waiting for conditions that cannot be met ✓
- b. exactly one process is waiting for a condition that cannot be met
- c. at least two processes are waiting for conditions that cannot be met
- d. any greater than one number of processes are waiting for conditions that cannot be met

Twoja odpowiedź jest poprawna.

The correct answer is: any greater than zero number of processes are waiting for conditions that cannot be met

**Question 37**

Correct

Mark 1.00 out of 1.00

SJF selects the task:

- a. who waited the longest in the queue
- b. with the least CPU requirement ✓
- c. which was first placed in the queue
- d. which was last placed in the queue

The correct answer is: with the least CPU requirement

**Question 38**

Partially correct

Mark 0.50 out of 1.00

Opening a file in UNIX writes the following entries in the operating system's data structures:

Select one or more:

- a. Inserting a new entry into the Table of Active I-nodes or increasing the counter in an existing entry ✓
- b. Inserting a new item into the Table of Open Files of the Process
- c. Inserting a new entry into the System Table of Open Files or incrementing a counter in an existing entry

Twoja odpowiedź jest częściowo poprawna.

You have correctly selected 1.

The correct answers are: Inserting a new entry into the Table of Active I-nodes or increasing the counter in an existing entry, Inserting a new item into the Table of Open Files of the Process

**Question 39**

Incorrect

Mark 0.00 out of 1.00

Which swapping algorithms use the history of page references (when was it last used or in which time slices was it used)?

Select one or more:

- a. FIFO ✗
- b. second chance
- c. working set
- d. LFU
- e. NRU ✗
- f. clock
- g. LRU
- h. no algorithm

Twoja odpowiedź jest niepoprawna.

The correct answers are: second chance, LRU, LFU, working set

**Question 40**

Partially correct

Mark 0.25 out of 1.00

Sequence of actions when starting a new task:

1. memory allocation if this is the first task of the program ✗
2. initialize the stack, fill the first frame ✗
3. filling in the descriptor in the kernel ✗
4. instruction to transfer control to the task ✓

Twoja odpowiedź jest częściowo poprawna.

You have correctly selected 1.

The correct answer is: 1. → filling in the descriptor in the kernel, 2. → memory allocation if this is the first task of the program, 3. → initialize the stack, fill the first frame, 4. → instruction to transfer control to the task

**Question 41**

Incorrect

Mark 0.00 out of 1.00

The page reference and modification bits are used to:

Select one or more:

- a. address translation support ✗
- b. locality of references detection
- c. checking whether the frame is empty or contains a page
- d. counting references for swapping optimization

Twoja odpowiedź jest niepoprawna.

The correct answer is: counting references for swapping optimization

**Question 42**

Correct

Mark 1.00 out of 1.00

For concurrency in OS:

- a. special processor support is required
- b. interrupt handling is necessary ✓
- c. timer interrupts are necessary
- d. cache memory is necessary

The correct answer is: interrupt handling is necessary

**Question 43**

Correct

Mark 1.00 out of 1.00

When the processor is released, the scheduler selects one of the queued processes:

Select one or more:

- a. running
- b. waiting
- c. suspended
- d. ready ✓

Twoja odpowiedź jest poprawna.

The correct answer is: ready

**Question 44**

Incorrect

Mark 0.00 out of 1.00

The page error (page fault) interrupt is used to:

Select one or more:

- a. checking whether the frame is empty or contains a page
- b. download the requested page to the primary memory
- c. detection of an attempt to write outside the address space of the frame
- d. detection of an access attempt from a frame not allocated to the program X

Twoja odpowiedź jest niepoprawna.

The correct answer is: download the requested page to the primary memory

**Question 45**

Correct

Mark 1.00 out of 1.00

Logical address is:

Select one or more:

- a. indirect address
- b. physical address
- c. effective address ✓
- d. relative address

Twoja odpowiedź jest poprawna.

The correct answer is: effective address

**Question 46**

Incorrect

Mark 0.00 out of 1.00

In UNIX, the disk contains the following areas:

Select one or more:

- a. Files data
- b. SuperBlock ✓
- c. I-node table ✓
- d. Directories ✗

Twoja odpowiedź jest niepoprawna.

The correct answers are: SuperBlock, I-node table, Files data

**Question 47**

Incorrect

Mark 0.00 out of 1.00

In a FAT-based disk system (without sharing allocation units by files), the number of files is directly limited by:

Select one or more:

- a. FAT table size
- b. The number of bits of the field describing the size of the file
- c. The size of the disk space
- d. Allocation unit size ✗
- e. The number of bits of the disk address ✗

Twoja odpowiedź jest niepoprawna.

The correct answers are: FAT table size, The size of the disk space

**Question 48**

Correct

Mark 1.00 out of 1.00

What mechanism is part of time-sharing systems?

- a. long-term scheduler
- b. swapping
- c. medium-term scheduler
- d. short-term scheduler ✓

The correct answer is: short-term scheduler

**Question 49**

Correct

Mark 1.00 out of 1.00

In what states can a task occur?

Select one or more:

- a. current ✓
- b. resetted
- c. ready ✓
- d. blocked ✓

Twoja odpowiedź jest poprawna.

The correct answers are: current, ready, blocked

**Question 50**

Incorrect

Mark 0.00 out of 1.00

Dynamic relocation is performed by:

- a. Loader ✗
- b. Special registers (DATUM)
- c. Segment descriptors
- d. Compiler

The correct answers are: Special registers (DATUM), Segment descriptors

**Question 51**

Incorrect

Mark 0.00 out of 1.00

What does the file system layer do?

- a. Manages remote files
- b. Manages remote file systems
- c. Manages free storage space
- d. Manages relationships between files ✘
- e. Manages directories

The correct answers are: Manages directories, Manages free storage space

**Question 52**

Correct

Mark 1.00 out of 1.00

Scheduling algorithms can be:

- a. term changing
- b. interrupting
- c. preemptive ✓
- d. indulgent ✓

The correct answers are: indulgent, preemptive

**Question 53**

Correct

Mark 1.00 out of 1.00

Which of the following information is stored on task switching?

- a. I/O status information ✓
- b. contents of general purpose registers, program counter, and similar registers available to the program ✓
- c. Contents of the instruction register and similar registers
- d. scheduler data ✓

The correct answers are: I/O status information, scheduler data, contents of general purpose registers, program counter, and similar registers available to the program

**Question 54**

Correct

Mark 1.00 out of 1.00

If the compiler prepares a program with absolute addresses to be loaded in a fixed address space, it is called:

- a. Static relocation ✓
- b. Static compiling
- c. Dynamic compiling
- d. Dynamic relocation

The correct answer is: Static relocation

**Question 55**

Correct

Mark 1.00 out of 1.00

Semaphores are used to solve the problem:

- a. process scheduling
- b. Belady problem
- c. mutual exclusion ✓
- d. races

The correct answer is: mutual exclusion

**Question 56**

Correct

Mark 1.00 out of 1.00

The effective address is at the same time:

Select one or more:

- a. logical address ✓
- b. physical address
- c. relative address
- d. indirect address

Twoja odpowiedź jest poprawna.

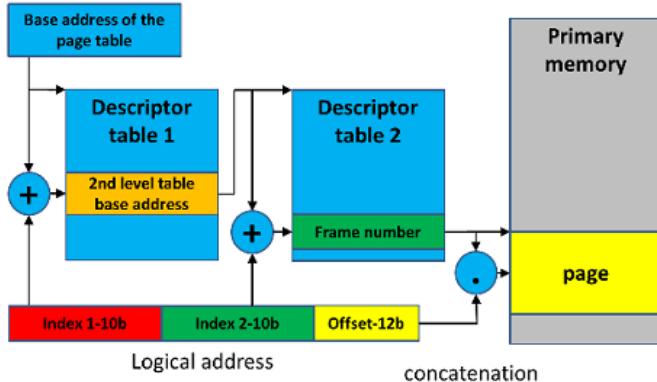
The correct answer is: logical address

**Question 57**

Incorrect

Mark 0.00 out of 1.00

Two-level TIS - place frame no:



Select one or more:

- a. in the table of the second level - on the right in the figure
- b. in the table of the first level - on the left in the figure
- c. part in the first level table and part in the second level table ✗
- d. none of the above answers

Twoja odpowiedź jest niepoprawna.

The correct answer is: in the table of the second level - on the right in the figure

**Question 58**

Correct

Mark 1.00 out of 1.00

The environment in which the process is executed includes:

Select one or more:

- a. A set of environment variables ✓
- b. Contents of the interrupt request register
- c. General purpose registers content ✓
- d. The content in the memory management unit
- e. Process address space ✓
- f. Open files ✓

Twoja odpowiedź jest poprawna.

The correct answers are: A set of environment variables, Process address space, General purpose registers content, Open files

**Question 59**

Incorrect

Mark 0.00 out of 1.00

Which of the following applies to user-level threads?

- a. User-level threads cost no execution time in system mode.
- b. User-level threads can themselves be multi-threaded. ✗
- c. The organization of user-level threads is specific to the operating system.
- d. User-level threads require their descriptors in the kernel.

The correct answer is: User-level threads cost no execution time in system mode.

**Question 60**

Correct

Mark 1.00 out of 1.00

What mechanism is used to save and restore the task state?

- a. context switch ✓
- b. applications counter
- c. task descriptor
- d. scheduling data

The correct answer is: context switch

**Question 61**

Correct

Mark 5.00 out of 5.00

What is the average time in the system for tasks in the batch, using SJF algorithm?

The system is equipped with 2 processors

task	1	2	3	4
processing time	3.9	4.6	2.1	1.2

Answer: 3.8 ✓

The correct answer is: 3.8

**Question 62**

Incorrect

Mark 0.00 out of 5.00

In RAID 4, data is placed in Strips that are "scattered" over the data disks, so that each subsequent strip is on the next data disk, modulo the number of disks. For this, there is a parity disk that holds the parity bits of zeroth bits, first bits, second bits, etc., equal-numbered strips divided by the number of data disks, for example, strips 0-3, 4-7, 8-11, etc.:



the start of strips 0,1,2,3 looks like this:

1	1	1	0	0	Parity disk
1	1	1	1	1	Disk 3
1	0	0	1	0	Disk 2
1	0	1	1	0	Disk 1
0	1	1	0	0	Disk 0

In the parity strip, the values are placed so that the parity bit keeps the corresponding strip bits 0-3 even.

Disk 3 has been corrupted and always reads 1. After replacing the disk with a new one, what values should I put in the strip on disk 3?

Answer:  ×

The correct answer is: 10100

**Question 63**

Incorrect

Mark 0.00 out of 5.00

Assuming that the instruction is 1-15 bytes, the data accessed in the instructions is 2, 4 or 8 bytes, the memory access addressing is on the alignment of a word (2 bytes), and the page size is 4kB, one instruction can cause the following number of exceptions "page fault":

Answer:  ×

The correct answer is: 4

WORST-FIT algorithm:

Question 1 Select one or more:

- a.  
Requires sorting the cut part into the list of free blocks
- b.  
It is designed to reduce external fragmentation
- c.  
It allows for fast determining whether there is a free block of the required size
- d.  
Requires a descending sort of the list of free blocks

**Feedback**

Twoja odpowiedź jest częściowo poprawna.

You have correctly selected 2.

The correct answers are: Requires a descending sort of the list of free blocks, It allows for fast determining whether there is a free block of the required size, It is designed to reduce external fragmentation, Requires sorting the cut part into the list of free blocks

Question 2

Incorrect

Mark 0.00 out of 1.00

[Flag question](#)

**Question text**

The hardware mechanisms necessary for paging are ("frame error" also called "page fault", "frame miss"):

Question 2 Select one or more:

- a.  
address translation, page index tables, "frame error" interrupt
- b.  
address translation, page index tables, page reference bits, "frame error" interrupt
- c.  
address translation, page index tables, "frame error" interrupt, associative memory, page swapper
- d.  
address translation, page index tables, page reference bits, "frame error" interrupt, associative memory

**Feedback**

Twoja odpowiedź jest niepoprawna.

The correct answer is: address translation, page index tables, "frame error" interrupt

Question 3

Incorrect

Mark 0.00 out of 1.00

Flag question

**Question text**

For address translation, the following is used:

Question 3Select one or more:

- a.  
translation register
- b.  
reference and protection bits
- c.  
index table
- d.  
associative translation buffer

**Feedback**

Twoja odpowiedź jest niepoprawna.

The correct answers are: index table, associative translation buffer

**Question 4**

Correct

Mark 1.00 out of 1.00

Flag question

**Question text**

The hardware resources of a computer system are:

Question 4Select one or more:

- a.  
Virtual memory
- b.  
Peripheral devices
- c.  
Processor time
- d.  
Windows on the screen

**Feedback**

Twoja odpowiedź jest poprawna.

The correct answers are: Processor time, Peripheral devices

**Question 5**

Correct

Mark 1.00 out of 1.00

Flag question

**Question text**

The following paging exceptions allow for returning to the program after they occur:

Question 5 Select one or more:

- a. interrupt on write (IOW)
- b. attempting to write to a write-protected frame
- c. attempt to read from the frame storing the code
- d. page fault

**Feedback**

Twoja odpowiedź jest poprawna.

The correct answers are: page fault, interrupt on write (IOW)

Question 6

Correct

Mark 1.00 out of 1.00

Flag question

**Question text**

The content of the last (lowest in the hierarchy) page index table is:

Answer: Question 6

**Feedback**

The correct answer is: frame

Question 7

Correct

Mark 1.00 out of 1.00

Flag question

**Question text**

Using the Test-And-Set instruction in synchronization:

Question 7 Select one or more:

- a. It requires processes to actively wait
- b. Stops the processor if 0 is read
- c. Requires the use of semaphores
- d. Requires organizing inactive waiting in queues

**Feedback**

Twoja odpowiedź jest poprawna.

The correct answer is: It requires processes to actively wait

**Question 8**

Incorrect

Mark 0.00 out of 1.00

[Flag question](#)

**Question text**

On UNIX, the number of files is directly limited by:

Question 8 Select one or more:

- a.  
The size of the space allocated for files
- b.  
Allocation unit size
- c.  
The number of bits of the field describing the size of the file
- d.  
FAT size
- e.  
The number of bits of the disk address

**Feedback**

Twoja odpowiedź jest niepoprawna.

The correct answer is: The size of the space allocated for files

**Question 9**

Incorrect

Mark 0.00 out of 1.00

[Flag question](#)

**Question text**

Having two-level page index tables:

Question 9 Select one or more:

- a.  
the content of the level I table element is concatenated (combined) with the content of the level II table element
- b.  
the content of a level I table element is added to the content of a level II table element
- c.  
the content of a level I table element points to a level II table
- d.  
the content of a level I table element is an index in a level II table

### Feedback

Twoja odpowiedź jest niepoprawna.

The correct answer is: the content of a level I table element points to a level II table

### Question 10

Incorrect

Mark 0.00 out of 1.00

Flag question

### Question text

Which swapping algorithms use information about a reference to pages in the last k periods of time?

Question 10Select one or more:

- a. FIFO
- b. working set clock
- c. optimal
- d. working set
- e. LRU
- f. drugiej szansy
- g. LFU
- h. no algorithm
- i. NRU

### Feedback

Twoja odpowiedź jest niepoprawna.

The correct answers are: working set, working set clock

### Question 11

Correct

Mark 1.00 out of 1.00

Flag question

### Question text

When a suspended program is moved to auxiliary memory, its process state is called:

Question 11Answer

- a.  
rinsed out
- b.  
swept away
- c.  
exchanged
- d.  
moved out

#### Feedback

The correct answer is: swept away

#### Question 12

Correct

Mark 1.00 out of 1.00

Flag question

#### Question text

The common allocation queue to fixed blocks of memory of equal size causes:

Question 12Select one or more:

- a.  
need for compaction
- b.  
external fragmentation
- c.  
internal fragmentation

#### Feedback

Twoja odpowiedź jest poprawna.

The correct answer is: internal fragmentation

#### Question 13

Incorrect

Mark 0.00 out of 1.00

Flag question

#### Question text

The effective address is also:

Question 13Select one or more:

- a.  
Indirect address
- b.  
Absolute address
- c.  
Logical address

d.

Physical address

**Feedback**

Twoja odpowiedź jest niepoprawna.

The correct answer is: Logical address

**Question 14**

Incorrect

Mark 0.00 out of 1.00

Flag question

**Question text**

In which swapping algorithms is it necessary to collectively clear the M-bits?

Question 14Select one or more:

- a. second chance
- b. NRU
- c. LFU
- d. no algorithm
- e. LRU
- f. working set
- g. working set clock
- h. clock
- i. FIFO

**Feedback**

Twoja odpowiedź jest niepoprawna.

The correct answer is:

no algorithm

**Question 15**

Incorrect

Mark 0.00 out of 1.00

Flag question

**Question text**

Dynamic relocation requires the use of:

Question 15 Select one or more:

- a.  
limit register
- b.  
base register (DATUM)
- c.  
status register
- d.  
program counter

**Feedback**

Twoja odpowiedź jest niepoprawna.

The correct answer is: base register (DATUM)

Question **16**

Incorrect

Mark 0.00 out of 1.00

[Flag question](#)

**Question text**

In UNIX, access rights are attributes:

Question 16 Select one or more:

- a.  
An entry in the I-node table
- b.  
User descriptor
- c.  
A special table specifying access rights
- d.  
A directory entry for a file

**Feedback**

Twoja odpowiedź jest niepoprawna.

The correct answer is: An entry in the I-node table

Question **17**

Correct

Mark 1.00 out of 1.00

[Flag question](#)

**Question text**

Which of the following facilities or abilities are required to provide mutual exclusion support?

Question 17Select one or more:

- a.  
A task that is performed outside the critical section must not affect the behavior of a task in the critical section.
- b.  
The relative speeds of the tasks must be taken into account.
- c.  
The task stays in its critical section only for a finite amount of time.
- d.  
Task scheduling must be considered.

**Feedback**

Twoja odpowiedź jest poprawna.

The correct answers are: A task that is performed outside the critical section must not affect the behavior of a task in the critical section., The task stays in its critical section only for a finite amount of time.

Question 18

Correct

Mark 1.00 out of 1.00

[Flag question](#)

**Question text**

How is exception identification performed?

Question 18Select one or more:

- a.  
the specification of hardware interrupts and errors is given over the data bus
- b.  
the specification of hardware interrupts and traps is given over the data bus
- c.  
all exceptions are specified using the data bus
- d.  
the specification of hardware interrupts is given over the data bus

**Feedback**

Twoja odpowiedź jest poprawna.

The correct answer is: the specification of hardware interrupts is given over the data bus

Question 19

Correct

Mark 1.00 out of 1.00

[Flag question](#)

**Question text**

Paging is in thrashing if:

**Question 19Answer**

- a.  
the system spends less time paging than execution
- b.  
page cannot be swapped
- c.  
the system spends more time paging than execution
- d.  
page faults occur

**Feedback**

The correct answer is: the system spends more time paging than execution

**Question 20**

Incorrect

Mark 0.00 out of 1.00

[Flag question](#)

**Question text**

Allocation unit for file storage:

**Question 20Answer**

- a.  
may differ between files in a partition
- b.  
it should be selected to match the characteristics of the data
- c.  
may be a variable in a partition
- d.  
may vary between partitions

**Feedback**

The correct answer is: may vary between partitions

**Question 21**

Correct

Mark 1.00 out of 1.00

[Flag question](#)

**Question text**

If a linker prepares a program with absolute addresses to be loaded in a fixed address space, it is called:

**Question 21Answer**

- a.  
Dynamic linking
- b.  
Dynamic relocation

- c.  
Static linking
- d.  
Static relocation

#### Feedback

The correct answer is: Static relocation

#### Question 22

Correct

Mark 1.00 out of 1.00

[Flag question](#)

#### Question text

At the blocked state is a process that:

Question 22Select one or more:

- a.  
occupies a processor
- b.  
waits for a processor
- c.  
fills the processor idle time
- d.  
waits for an I/O operation to complete

#### Feedback

Twoja odpowiedź jest poprawna.

The correct answer is: waits for an I/O operation to complete

#### Question 23

Correct

Mark 1.00 out of 1.00

[Flag question](#)

#### Question text

The optimal scheduling algorithm in terms of minimizing the average time in the system of a given task is:

Question 23Select one or more:

- a.  
priority
- b.  
FCFS
- c.  
time slicing
- d.

SJF

Feedback

Twoja odpowiedź jest poprawna.

The correct answer is: SJF

**Question 24**

Incorrect

Mark 0.00 out of 1.00

Flag question

Question text

Allocation unit for storing files:

Question 24Answer

- a.  
may vary between partitions
- b.  
it should be selected to match the characteristics of the data
- c.  
must be constant across the disk partition
- d.  
may differ between files in a partition

Feedback

The correct answers are: must be constant across the disk partition, may vary between partitions

**Question 25**

Correct

Mark 1.00 out of 1.00

Flag question

Question text

Is IOW bit:

Question 25Select one or more:

- a.  
protection bit
- b.  
enable bit
- c.  
reference bit

Feedback

Twoja odpowiedź jest poprawna.

The correct answer is: protection bit

**Question 26**

Correct

Mark 1.00 out of 1.00

[Flag question](#)**Question text**

The Test-And-Set or Compare-And-Swap instruction has the following characteristics:

Question 26Select one or more:

a.

It is possible to use only in 1-processor systems

b.

Requires active waiting from tasks

c.

It is possible to deadlock with TAS/CAS operations on multiple variables

d.

It is possible to use only on computers with common memory

**Feedback**

Twoja odpowiedź jest poprawna.

The correct answers are: Requires active waiting from tasks, It is possible to use only on computers with common memory, It is possible to deadlock with TAS/CAS operations on multiple variables

**Question 27**

Correct

Mark 1.00 out of 1.00

[Flag question](#)**Question text**

Collective interrupt mask is:

Question 27Select one or more:

a.

a register that blocks or unblocks all interrupts

b.

a combinational circuit that calculates the number of the interrupt received

c.

register in which the address of the interrupt controller is stored

d.

a register that blocks or unlocks a non-maskable interrupt

**Feedback**

Twoja odpowiedź jest poprawna.

The correct answer is: a register that blocks or unblocks all interrupts

**Question 28**

Incorrect  
Mark 0.00 out of 1.00

Flag question

#### Question text

Which swapping algorithms can be implemented based on hardware support in the form of a collective reading of reference bits and collective clearing of these bits?

Question 28Select one or more:

- a.  
LRU
- b.  
FIFO
- c.  
working set clock
- d.  
optimal
- e.  
no algorithm
- f.  
LFU
- g.  
NRU
- h.  
working set
- i.  
second chance

#### Feedback

Twoja odpowiedź jest niepoprawna.

The correct answers are: LRU, LFU

Question 29

Correct  
Mark 1.00 out of 1.00

Flag question

#### Question text

The scheduler decisions take the form:

Question 29Select one or more:

- a.  
change from active to ready state
- b.  
change from waiting to ready state

- c.  
change from ready to active state
- d.  
change from waiting to active state

#### Feedback

Twoja odpowiedź jest poprawna.

The correct answer is: change from ready to active state

#### Question 30

Incorrect

Mark 0.00 out of 1.00

[Flag question](#)

#### Question text

Address translation aims to:

Question 30Select one or more:

- a.  
Generating a "frame error" interrupt when the page is out of memory
- b.  
detecting the phenomenon of locality of references
- c.  
converting a virtual address to a physical one
- d.  
converting a physical address to a virtual one

#### Feedback

Twoja odpowiedź jest niepoprawna.

The correct answer is: converting a virtual address to a physical one

#### Question 31

Incorrect

Mark 0.00 out of 1.00

[Flag question](#)

#### Question text

Fragmentation is implied by:

Question 31Select one or more:

- a.  
Internal by partitioning into quantized blocks
- b.  
External by resizing allocated blocks
- c.  
Internal by paging

d.

External by freeing blocks in a deallocation order not reverse to allocation

e.

External by segmentation

#### Feedback

Twoja odpowiedź jest niepoprawna.

The correct answers are: Internal by paging, Internal by partitioning into quantized blocks, External by freeing blocks in a deallocation order not reverse to allocation, External by resizing allocated blocks

#### Question 32

Correct

Mark 1.00 out of 1.00

Flag question

#### Question text

"Soft" real-time system:

Question 32Select one or more:

a.

Guarantees interrupt handling time

b.

Guarantees average response time

c.

Guaranteed response time

#### Feedback

Twoja odpowiedź jest poprawna.

The correct answer is: Guarantees average response time

#### Question 33

Correct

Mark 1.00 out of 1.00

Flag question

#### Question text

During the interrupt handling:

Question 33Select one or more:

a.

other interrupts may or may not be accepted at the discretion of the programmer

b.

other interrupts can be accepted

c.

other interrupts are disabled

**Feedback**

Twoja odpowiedź jest poprawna.

The correct answer is: other interrupts may or may not be accepted at the discretion of the programmer

**Question 34**

Incorrect

Mark 0.00 out of 1.00

[Flag question](#)

**Question text**

A multiprogram system is one that, in principle:

Question 34Select one or more:

- a.  
Requires relocation or equivalent mechanism
- b.  
It allows for storing many programs in primary memory
- c.  
Requires dynamic relocation
- d.  
It allows for running programs only one after another

**Feedback**

Twoja odpowiedź jest niepoprawna.

The correct answers are: It allows for storing many programs in primary memory, Requires relocation or equivalent mechanism

**Question 35**

Incorrect

Mark 0.00 out of 1.00

[Flag question](#)

**Question text**

A multiuser system is one that, in principle:

Question 35Select one or more:

- a.  
Must be concurrent
- b.  
Requires the use of timer interrupts
- c.  
Must be multi-threaded
- d.  
Allows multiple processes to actually run simultaneously

**Feedback**

Twoja odpowiedź jest niepoprawna.

The correct answers are: Must be concurrent, Requires the use of timer interrupts

**Question 36**

Correct

Mark 1.00 out of 1.00

Flag question

**Question text**

The scheduling goal, which is to occupy processors as efficiently as possible, is:

Question 36Select one or more:

- a.  
response time
- b.  
throughput
- c.  
utilization

**Feedback**

Twoja odpowiedź jest poprawna.

The correct answer is: utilization

**Question 37**

Correct

Mark 1.00 out of 1.00

Flag question

**Question text**

In a multitasking environment, the operating system decides which task the CPU gets, when, and for how long. This feature is called:

Question 37Answer

- a.  
traffic control
- b.  
task timetable management
- c.  
task management
- d.  
task scheduling

**Feedback**

The correct answer is: task scheduling

**Question 38**

Correct

Mark 1.00 out of 1.00

[Flag question](#)

#### Question text

Which of the following statements is true for system level threads?

Question 38Answer

a.

Multithreaded applications cannot use multiprocessing.

b.

User-level threads can be synchronized by the kernel.

c.

The threading implementation at the kernel level is done by the thread library attached to the program.

d.

Kernel-level threads require their descriptors in the kernel.

#### Feedback

The correct answer is: Kernel-level threads require their descriptors in the kernel.

Question 39

Correct

Mark 1.00 out of 1.00

[Flag question](#)

#### Question text

Interrupt mask:

Question 39Select one or more:

a.

causes interrupts to be disabled when an interrupt is accepted

b.

must be part of the status register

c.

can be set and reset by special processor instructions

d.

can unblock interrupts when the interrupt handler completes

#### Feedback

Twoja odpowiedź jest poprawna.

The correct answers are: causes interrupts to be disabled when an interrupt is accepted, can unblock interrupts when the interrupt handler completes, can be set and reset by special processor instructions

Question 40

Correct

Mark 1.00 out of 1.00

[Flag question](#)

**Question text**

What does the kernel do when there is no task (process) to run?

Question 40Select one or more:

- a.  
switches off the power supply
- b.  
resets the entire system
- c.  
starts the idle task
- d.  
executes an infinite loop in the kernel until a task arrives

**Feedback**

Twoja odpowiedź jest poprawna.

The correct answer is: starts the idle task

Question **41**

Correct

Mark 1.00 out of 1.00

[Flag question](#)

**Question text**

Is memory protection useless in a non-concurrent system?

Question 41Answer

True

False

**Feedback**

The correct answer is 'False'.

Question **42**

Correct

Mark 1.00 out of 1.00

[Flag question](#)

**Question text**

The program supervisor layer in the operating system has the following role:

Question 42Select one or more:

- a.  
Deals with the management of primary memory (memory allocation to programs)
- b.  
Intercepts all program system calls and routes them to the appropriate layers
- c.  
Runs programs
- d.

Deals with buffering data written and read from mass memory

**Feedback**

Twoja odpowiedź jest poprawna.

The correct answers are: Intercepts all program system calls and routes them to the appropriate layers, Runs programs, Deals with the management of primary memory (memory allocation to programs)

**Question 43**

Incorrect

Mark 0.00 out of 1.00

[Flag question](#)

**Question text**

A process always transitions from the "user" state to the "system" state as a result of:

Question 43Select one or more:

- a.  
Debugger trap
- b.  
Hardware interrupt
- c.  
Process suspension
- d.  
A software interrupt that calls a system function

**Feedback**

Twoja odpowiedź jest niepoprawna.

The correct answers are: A software interrupt that calls a system function, Debugger trap

**Question 44**

Correct

Mark 1.00 out of 1.00

[Flag question](#)

**Question text**

The key in associative memory is:

Question 44Select one or more:

- a.  
The page number concatenated with the frame number
- b.  
The frame number concatenated with the page number
- c.  
Frame number
- d.  
Page number

**Feedback**

Twoja odpowiedź jest poprawna.

The correct answer is: Page number

**Question 45**

Correct

Mark 1.00 out of 1.00

Flag question

**Question text**

At the ready state is a process that:

Question 45Select one or more:

- a. fills the processor idle time
- b. occupies a processor
- c. waits for a processor
- d. waits for an I/O operation to complete

**Feedback**

Twoja odpowiedź jest poprawna.

The correct answer is: waits for a processor

**Question 46**

Incorrect

Mark 0.00 out of 1.00

Flag question

**Question text**

Between fork and exec operations, the following operations are performed:

Question 46Select one or more:

- a. Loading the program to be started into memory
- b. Allocating the appropriate amount of memory for the program being started
- c. Opening the appropriate input/output files

**Feedback**

Twoja odpowiedź jest niepoprawna.

The correct answer is: Opening the appropriate input/output files

**Question 47**

Correct

Mark 1.00 out of 1.00

Flag question

#### Question text

How does the operating system call the task completion subroutine?

- Answer 1 Question 47 Choose...sets the trace in the terminating subroutine to the current position  
4. builds an interrupt vector on the system stack pointing to the terminating subroutine code  
builds the frame of the terminating subroutine on the task stack  
recreates the context programmatically and executes the IRET instruction

- Answer 2 Question 47 Choose...sets the trace in the terminating subroutine to the current position  
2. builds an interrupt vector on the system stack pointing to the terminating subroutine code  
builds the frame of the terminating subroutine on the task stack  
recreates the context programmatically and executes the IRET instruction

- Answer 3 Question 47 Choose...sets the trace in the terminating subroutine to the current position  
1. builds an interrupt vector on the system stack pointing to the terminating subroutine code  
builds the frame of the terminating subroutine on the task stack  
recreates the context programmatically and executes the IRET instruction

- Answer 4 Question 47 Choose...sets the trace in the terminating subroutine to the current position  
3. builds an interrupt vector on the system stack pointing to the terminating subroutine code  
builds the frame of the terminating subroutine on the task stack  
recreates the context programmatically and executes the IRET instruction

#### Feedback

Twoja odpowiedź jest poprawna.

The correct answer is: 4. → recreates the context programmatically and executes the IRET instruction, 2. → sets the trace in the terminating subroutine to the current position, 1. → builds the frame of the terminating subroutine on the task stack, 3. → builds an interrupt vector on the system stack pointing to the terminating subroutine code

### Question 48

Partially correct

Mark 0.50 out of 1.00

Flag question

#### Question text

Which of the following memory allocation schemes causes external fragmentation?

Question 48 Answer

- a.  
Multiple contiguous fixed partitions of equal size
- b.  
Paging
- c.  
Segmentation
- d.  
Multiple contiguous fixed partitions of various sizes

#### Feedback

The correct answers are: Segmentation, Multiple contiguous fixed partitions of various sizes

**Question 49**

Incorrect

Mark 0.00 out of 1.00

[Flag question](#)

**Question text**

The kernel is \_\_\_\_\_ user-level threads.

**Question 49Answer**

- a.  
unaware
- b.  
aware
- c.  
part
- d.  
creator

**Feedback**

The correct answer is: unaware

**Question 50**

Correct

Mark 1.00 out of 1.00

[Flag question](#)

**Question text**

Context switch is:

**Question 50Select one or more:**

- a.  
calling the kernel of the operating system
- b.  
switching to the system stack
- c.  
extracode execution
- d.  
writing registers to the task stack and retrieving them from another task stack

**Feedback**

Twoja odpowiedź jest poprawna.

The correct answer is: writing registers to the task stack and retrieving them from another task stack

**Question 51**

Correct

Mark 1.00 out of 1.00

Flag question

Question text

Operation V on a raised binary semaphore:

Question 51 Select one or more:

a.

It does not change the value of the semaphore

b.

Increases semaphore value by 1

c.

It is stored in order to be able to perform as many operations P as there were V

Feedback

Twoja odpowiedź jest poprawna.

The correct answer is: It does not change the value of the semaphore

Question 52

Incorrect

Mark 0.00 out of 1.00

Flag question

Question text

The combination of paging and segmentation consists in:

Question 52 Select one or more:

a.

identifying segments with pages

b.

the use of a segment table or a pool of segment registers treated as an additional, superior level of paging

c.

Generating a "frame error" interrupt when the frame containing the page does not belong to the current segment

d.

dividing pages into segments

Feedback

Twoja odpowiedź jest niepoprawna.

The correct answer is: the use of a segment table or a pool of segment registers treated as an additional, superior level of paging

Question 53

Correct

Mark 1.00 out of 1.00

Flag question

**Question text**

Scheduling algorithms can be:

Question 53Answer

- a. indulgent
- b. interrupting
- c. term changing
- d. preemptive

**Feedback**

The correct answers are: indulgent, preemptive

Question **54**

Incorrect

Mark 0.00 out of 1.00

[Flag question](#)

**Question text**

MMU uses index tables to:

Question 54Select one or more:

- a. generate an effective address
- b. generate a relative address
- c. generate a logical address
- d. generate a physical address

**Feedback**

Twoja odpowiedź jest niepoprawna.

The correct answer is: generate a physical address

Question **55**

Correct

Mark 1.00 out of 1.00

[Flag question](#)

**Question text**

When is the scheduler called?

Question 55Select one or more:

- a.

- at the request of a user task
- b.  
when the scheduler decides itself
- c.  
at the end of the execution of each kernel procedure
- d.  
at the start of execution of each kernel procedure

#### Feedback

Twoja odpowiedź jest poprawna.

The correct answer is: at the end of the execution of each kernel procedure

#### Question 56

Correct

Mark 1.00 out of 1.00

[Flag question](#)

#### Question text

After performing the mount(/dev/hd5,/usr/x/bin/hd5) operation, the file /usr/z/a on the mounted disk should be referenced by:

Question 56 Select one or more:

- a.  
`/dev/hd5/usr/z/a`
- b.  
`/usr/x/bin/hd5/usr/z/a`
- c.  
`/usr/x/bin/dev/hd5/usr/z/a`

#### Feedback

Twoja odpowiedź jest poprawna.

The correct answer is: `/usr/x/bin/hd5/usr/z/a`

#### Question 57

Correct

Mark 1.00 out of 1.00

[Flag question](#)

#### Question text

Interrupt vector is saved in a case of:

Question 57 Select one or more:

- a.  
jump with trace
- b.  
accepting a non-maskable interrupt
- c.

subroutine call

d.

accepting a hardware interrupt

**Feedback**

Twoja odpowiedź jest poprawna.

The correct answers are: accepting a hardware interrupt, accepting a non-maskable interrupt, jump with trace

**Question 58**

Correct

Mark 1.00 out of 1.00

Flag question

**Question text**

What are the functions of the kernel?

**Question 58Answer**

a.

File management

b.

Memory management

c.

Interrupt handling

d.

Program management

**Feedback**

The correct answer is: Interrupt handling

**Question 59**

Correct

Mark 1.00 out of 1.00

Flag question

**Question text**

By definition, a deadlock is a situation where:

**Question 59Select one or more:**

a.

at least two processes are waiting for conditions that cannot be met

b.

any greater than zero number of processes are waiting for conditions that cannot be met

c.

any greater than one number of processes are waiting for conditions that cannot be met

d.

exactly two processes are waiting for conditions that cannot be met

### Feedback

Twoja odpowiedź jest poprawna.

The correct answer is: any greater than zero number of processes are waiting for conditions that cannot be met

### Question 60

Correct

Mark 1.00 out of 1.00

Flag question

### Question text

In a concurrent environment, the operating system decides which task the CPU gets, when, and for how long. This feature is called:

#### Question 60Answer

a.

task scheduling

b.

traffic management

c.

task management

d.

task timetable planning

### Feedback

The correct answer is: task scheduling

### Question 61

Correct

Mark 5.00 out of 5.00

Flag question

### Question text

What is the average time in the system for tasks in the batch, using SJF algorithm?

task	1	2	3	4
processing time	3.1	6.7	2.8	1.1

Answer:Question 61

### Feedback

The correct answer is: 6.4

### Question 62

Incorrect

Mark 0.00 out of 5.00

Flag question

### Question text

In RAID 4, data is placed in Strips that are "scattered" over the data disks, so that each subsequent strip is on the next data disk, modulo the number of disks. For this, there is a parity disk that holds the parity bits of zeroth bits, first bits, second bits, etc., equal-numbered strips divided by the number of data disks, for example, strips 0-3, 4-7, 8-11, etc.:

the start of strips 0,1,2,3 looks like this:

0	1	0	0	1	Parity disk
0	0	0	0	0	Disk 3
1	0	1	1	0	Disk 2
1	1	0	0	1	Disk 1
0	1	1	0	0	Disk 0

In the parity strip, the values are placed so that the parity bit keeps the corresponding strip bits 0-3 odd.

Disk 3 has been damaged and reads only 0. After replacing the disk with a new one, what values should be put in the strip on disk 3?

Answer:Question 62

### Feedback

The correct answer is: 10101

Question **63**

Incorrect

Mark 0.00 out of 5.00

Flag question

### Question text

Assuming memory cells are 1-byte, the page number in the address field is 12 bits, the offset is 12 bits, the frame number is 10 bits, and all entries in the TIS page index table are on a 16-bit word boundary, enter:

- the maximum size of the program's virtual memory in MB

Answer:Question 63

### Feedback

The correct answer is: 4

<b>Started on</b>	Wednesday, 19 June 2024, 12:16 PM
<b>State</b>	Finished
<b>Completed on</b>	Wednesday, 19 June 2024, 1:40 PM
<b>Time taken</b>	1 hour 23 mins
<b>Marks</b>	39.83/75.00
<b>Grade</b>	21.24 out of 40.00 (53.11%)

**Question 1**

Correct

Mark 1.00 out of 1.00

The conversion of the effective address to the physical one takes place:

Select one or more:

- a. in the arithmetic-logic unit
- b. in the sequencer
- c. in the bus arbiter
- d. in the memory management unit ✓

Twoja odpowiedź jest poprawna.

The correct answer is: in the memory management unit

**Question 2**

Incorrect

Mark 0.00 out of 1.00

The following situations trigger "error" exceptions:

Select one or more:

- a. memory reference beyond limit register value ✓
- b. a reference to memory that is not in the program address space ✓
- c. memory reference in the area of the page that is not in memory ✗
- d. an attempt to execute an instruction from the area of the page for which the "no code" bit was set ✓

Twoja odpowiedź jest niepoprawna.

The correct answers are: a reference to memory that is not in the program address space, memory reference beyond limit register value, an attempt to execute an instruction from the area of the page for which the "no code" bit was set

**Question 3**

Correct

Mark 1.00 out of 1.00

Consider the following sequence of address references:

123, 215, 600, 1234, 76, 96.

If the page size is 100, the order of page references is as follows:

- a. 0,2,6,12,0,0
- b. 1,2,6,12
- c. 12,21,60,123,7,9
- d. 1,2,6,12,0,0 ✓

The correct answer is: 1,2,6,12,0,0

**Question 4**

Incorrect

Mark 0.00 out of 1.00

FIRST-FIT algorithm:

Select one or more:

- a. Requires an ascending sorting of the list of free blocks
- b. Avoids external fragmentation
- c. Causes external fragmentation ✓
- d. It allows for fast determining whether there is a free block of the required size ✗

Twoja odpowiedź jest niepoprawna.

The correct answer is: Causes external fragmentation

**Question 5**

Incorrect

Mark 0.00 out of 1.00

The multi-level interrupt controller includes:

Select one or more:

- a. Collective interrupt mask ✓
- b. The register of interrupts being serviced ✗
- c. Interrupt request register ✓
- d. Individual interrupt mask ✓

Twoja odpowiedź jest niepoprawna.

The correct answers are: Collective interrupt mask, Interrupt request register, Individual interrupt mask

**Question 6**

Correct

Mark 1.00 out of 1.00

Which of the following facilities or abilities are required to provide mutual exclusion support?

Select one or more:

- a. A task that is performed outside the critical section must not affect the behavior of a task in the critical section. ✓
- b. The relative speeds of the tasks must be taken into account.
- c. The task stays in its critical section only for a finite amount of time. ✓
- d. Task scheduling must be considered.

Twoja odpowiedź jest poprawna.

The correct answers are: A task that is performed outside the critical section must not affect the behavior of a task in the critical section., The task stays in its critical section only for a finite amount of time.

**Question 7**

Incorrect

Mark 0.00 out of 1.00

Conditional variables in a monitor

Select one or more:

- a. They are used to check whether the conditions for process continuation are met ✗
- b. They guard access to the critical region of the monitor
- c. They are used to suspend processes that cannot run because the conditions for their continuation are not met ✓

Twoja odpowiedź jest niepoprawna.

The correct answer is: They are used to suspend processes that cannot run because the conditions for their continuation are not met

**Question 8**

Correct

Mark 1.00 out of 1.00

When an exception is raised in user mode, the operating system switches to the kernel system stack, and what happens when an exception is raised in system mode?

Select one or more:

- a. initializes the kernel system stack from the scratch
- b. switches back to the application program stack
- c. switches to the next kernel system stack
- d. nothing special, it builds the context on the kernel system stack ✓

Twoja odpowiedź jest poprawna.

The correct answer is: nothing special, it builds the context on the kernel system stack

**Question 9**

Incorrect

Mark 0.00 out of 1.00

In which swapping algorithms is it necessary to collectively clear the M-bits?

Select one or more:

- a. LRU ✗
- b. working set clock ✗
- c. second chance ✗
- d. NRU ✗
- e. LFU
- f. no algorithm
- g. working set ✗
- h. clock ✗
- i. FIFO

Twoja odpowiedź jest niepoprawna.

The correct answer is:

no algorithm

**Question 10**

Partially correct

Mark 0.50 out of 1.00

System/user threads:

Select one or more:

- a. System level thread descriptors are stored in the operating system kernel. ✓
- b. User-level threads share the same execution context.
- c. User-level threads share the same stack.

Twoja odpowiedź jest częściowo poprawna.

You have correctly selected 1.

The correct answers are: System level thread descriptors are stored in the operating system kernel., User-level threads share the same execution context.

**Question 11**

Partially correct

Mark 0.50 out of 1.00

Sequence of actions when starting a new task:

1. memory allocation if this is the first task of the program ✗
2. filling in the descriptor in the kernel ✗
3. initialize the stack, fill the first frame ✓
4. instruction to transfer control to the task ✓

Twoja odpowiedź jest częściowo poprawna.

You have correctly selected 2.

The correct answer is: 1. → filling in the descriptor in the kernel, 2. → memory allocation if this is the first task of the program, 3. → initialize the stack, fill the first frame, 4. → instruction to transfer control to the task

**Question 12**

Incorrect

Mark 0.00 out of 1.00

Which scheduling is used to organize concurrency?

Select one or more:

- a. short-term ✓
- b. long-term
- c. medium-term ✗
- d. preempting ✗

Twoja odpowiedź jest niepoprawna.

The correct answer is: short-term

**Question 13**

Incorrect

Mark 0.00 out of 1.00

During the interrupt handling:

Select one or more:

- a. other interrupts are disabled ✗
- b. other interrupts may or may not be accepted at the discretion of the programmer ✓
- c. other interrupts can be accepted ✗

Twoja odpowiedź jest niepoprawna.

The correct answer is: other interrupts may or may not be accepted at the discretion of the programmer

**Question 14**

Correct

Mark 1.00 out of 1.00

Which of the following memory allocation schemes causes external fragmentation?

- a. Sweeping ✓
- b. Multiple contiguous fixed partitions of equal size
- c. Paging
- d. Multiple contiguous fixed partitions of various sizes ✓

The correct answers are: Sweeping, Multiple contiguous fixed partitions of various sizes

**Question 15**

Partially correct

Mark 0.50 out of 1.00

The direct resume rule means that:

Select one or more:

- a. The resuming process loses the critical region
- b. The resuming process applies for the critical region just like other processes waiting to enter the critical region ✓
- c. The resuming process gets a critical region after the resumed process exits the critical region

Twoja odpowiedź jest częściowo poprawna.

You have correctly selected 1.

The correct answers are: The resuming process loses the critical region, The resuming process applies for the critical region just like other processes waiting to enter the critical region

**Question 16**

Incorrect

Mark 0.00 out of 1.00

Which technique was introduced because a single task could occupy both the CPU and I/O devices?

Select one or more:

- a. Interrupts
- b. Buffering
- c. Multiprogramming ✗
- d. Preemptive scheduling ✗

Twoja odpowiedź jest niepoprawna.

The correct answer is: Interrupts

**Question 17**

Incorrect

Mark 0.00 out of 1.00

The page reference and modification bits are used to:

Select one or more:

- a. Indication whether the frame is empty or contains a page
- b. Detection of locality of references ✗
- c. Counting references to optimize exchanges ✓
- d. Address translation support

Twoja odpowiedź jest niepoprawna.

The correct answer is: Counting references to optimize exchanges

**Question 18**

Partially correct

Mark 0.50 out of 1.00

Which mechanisms are supported by the phenomenon of locality of references?

Select one or more:

- a. page swapping ✓
- b. multilevel page index tables
- c. address translation
- d. reverse page index tables
- e. associative memory of page references ✓

Twoja odpowiedź jest częściowo poprawna.

You have correctly selected 2.

The correct answers are: page swapping, multilevel page index tables, reverse page index tables, associative memory of page references

**Question 19**

Incorrect

Mark 0.00 out of 1.00

In operating system:

Select one or more:

- a. timer interrupt may not be handled
- b. the decision to handle an exception or not is made dynamically ✗
- c. every exception must be handled
- d. some exceptions are handled, some not ✗

Twoja odpowiedź jest niepoprawna.

The correct answer is: every exception must be handled

**Question 20**

Correct

Mark 1.00 out of 1.00

The operating system plays the following role in a computer system:

Select one or more:

- a. Create a concurrent environment ✓
- b. computer system resource management ✓
- c. creating abstraction (virtualization) of hardware ✓
- d. relational database management

Twoja odpowiedź jest poprawna.

The correct answers are: Create a concurrent environment, computer system resource management, creating abstraction (virtualization) of hardware

**Question 21**

Incorrect

Mark 0.00 out of 1.00

Scheduling disk access involves deciding on the following:

- a. the order in which disk access requests should be handled ✓
- b. about the physical location of the files
- c. which drive should be used next ✗
- d. about the type of disks the system should have

The correct answer is: the order in which disk access requests should be handled

**Question 22**

Incorrect

Mark 0.00 out of 1.00

The scheduler decisions take the form:

Select one or more:

- a. change from active to ready state ✗
- b. change from ready to active state ✓
- c. change from waiting to ready state ✗
- d. change from ready to waiting state ✗

Twoja odpowiedź jest niepoprawna.

The correct answer is: change from ready to active state

**Question 23**

Partially correct

Mark 0.50 out of 1.00

What mechanism is part of batch systems?

- a. high-level scheduler ✓
- b. no scheduler is needed
- c. medium-level scheduler
- d. low-level scheduler

The correct answers are: high-level scheduler, medium-level scheduler

**Question 24**

Incorrect

Mark 0.00 out of 1.00

A multiprogram system is one that, in principle:

Select one or more:

- a. It allows you to store many programs in mass memory ✗
- b. It allows for running programs only one after another
- c. It allows for storing many programs in primary memory ✓
- d. Allows more than one program to run simultaneously ✗

Twoja odpowiedź jest niepoprawna.

The correct answer is: It allows for storing many programs in primary memory

**Question 25**

Correct

Mark 1.00 out of 1.00

The operating system plays the following role in a computer system:

Select one or more:

- a. compiling and running programs
- b. computer system resource management ✓
- c. Create a concurrent environment ✓
- d. relational database management

Twoja odpowiedź jest poprawna.

The correct answers are: Create a concurrent environment, computer system resource management

**Question 26**

Incorrect

Mark 0.00 out of 1.00

What does the file system layer do?

- a. Manages remote file systems
- b. Manages remote files
- c. Manages files ✓
- d. Manages relationships between files ✗

The correct answer is: Manages files

**Question 27**

Incorrect

Mark 0.00 out of 1.00

The system stack must provide space for:

Select one or more:

- a. CPU registers ✗
- b. Processor registers in as many copies as there are devices in the system +1
- c. Processor registers in as many copies as there are interrupt lines and possible software interrupts ✗
- d. Processor registers in as many copies as there are interrupt lines +1

Twoja odpowiedź jest niepoprawna.

The correct answer is: Processor registers in as many copies as there are interrupt lines +1

**Question 28**

Incorrect

Mark 0.00 out of 1.00

A multiuser system is one that, in principle:

Select one or more:

- a. Must be concurrent ✓
- b. Allows multiple processes to actually run simultaneously ✗
- c. Requires the use of timer interrupts ✓
- d. Must be multi-threaded

Twoja odpowiedź jest niepoprawna.

The correct answers are: Must be concurrent, Requires the use of timer interrupts

**Question 29**

Correct

Mark 1.00 out of 1.00

A typical collection of program segments includes (some of them can be combined):

Select one or more:

- a. stack segment ✓
- b. Code segment ✓
- c. data segment ✓
- d. processor registers segment
- e. page index tables segment

Twoja odpowiedź jest poprawna.

The correct answers are: Code segment, data segment, stack segment

**Question 30**

Incorrect

Mark 0.00 out of 1.00

In UNIX, the disk contains the following areas:

Select one or more:

- a. Directories ✕
- b. I-node table ✓
- c. SuperBlock ✓
- d. Files data ✓

Twoja odpowiedź jest niepoprawna.

The correct answers are: SuperBlock, I-node table, Files data

**Question 31**

Incorrect

Mark 0.00 out of 1.00

A single-program system is one that, in principle:

Select one or more:

- a. Runs on a uniprocessor computer ✕
- b. Needs relocation
- c. Allows for storing only one program in primary memory ✓
- d. Allows for storing only one program in mass memory

Twoja odpowiedź jest niepoprawna.

The correct answer is: Allows for storing only one program in primary memory

**Question 32**

Correct

Mark 1.00 out of 1.00

Which task queue can never be empty?

Select one or more:

- a. swept away tasks
- b. running tasks ✓
- c. ready tasks
- d. suspended tasks

Twoja odpowiedź jest poprawna.

The correct answer is: running tasks

**Question 33**

Incorrect

Mark 0.00 out of 1.00

Semaphore function is to:

- a. memory management
- b. synchronize critical resources to prevent deadlock ✓
- c. synchronize processes for better CPU utilization ✗
- d. process scheduling

The correct answer is: synchronize critical resources to prevent deadlock

**Question 34**

Incorrect

Mark 0.00 out of 1.00

Which swapping algorithms use the current time slice number?

Select one or more:

- a. NRU
- b. clock
- c. FIFO
- d. second chance
- e. no algorithm
- f. LFU
- g. working set ✓
- h. optimal
- i. LRU ✗

Twoja odpowiedź jest niepoprawna.

The correct answers are: second chance, working set

**Question 35**

Correct

Mark 1.00 out of 1.00

Page Index Table address is kept in:

Select one or more:

- a. program counter
- b. stack pointer
- c. page table base register ✓
- d. page register

Twoja odpowiedź jest poprawna.

The correct answer is: page table base register

**Question 36**

Partially correct

Mark 0.33 out of 1.00

Which of the following information is stored on task switching?

- a. contents of general purpose registers, program counter, and similar registers available to the program ✓
- b. Contents of the instruction register and similar registers
- c. I/O status information
- d. scheduler data

The correct answers are: I/O status information, scheduler data, contents of general purpose registers, program counter, and similar registers available to the program

**Question 37**

Incorrect

Mark 0.00 out of 1.00

The hardware mechanisms necessary for paging are ("frame error" also called "page fault", "frame miss"):

Select one or more:

- a. address translation, page index tables, page reference bits, "frame error" interrupt ✗
- b. address translation, page index tables, "frame error" interrupt
- c. address translation, page index tables, "frame error" interrupt, associative memory, page swapper ✗
- d. address translation, page index tables, page reference bits, "frame error" interrupt, associative memory ✗

Twoja odpowiedź jest niepoprawna.

The correct answer is: address translation, page index tables, "frame error" interrupt

**Question 38**

Correct

Mark 1.00 out of 1.00

The relocating loader generates addresses as the program is loaded into primary memory. These addresses are:

- a. Relative
- b. Absolute ✓
- c. Symbolic
- d. Indirect

The correct answer is: Absolute

**Question 39**

Incorrect

Mark 0.00 out of 1.00

When starting a program, how is control passed to it from the operating system?

Select one or more:

- a. jump with trace
- b. extracode
- c. jump ✗
- d. return from interrupt handler IRET ✓

Twoja odpowiedź jest niepoprawna.

The correct answer is: return from interrupt handler IRET

**Question 40**

Partially correct

Mark 0.50 out of 1.00

What does the file system layer do?

- a. Manages remote files
- b. Manages files ✓
- c. Manages remote file systems
- d. Tracks the status of information

The correct answers are: Tracks the status of information, Manages files

**Question 41**

Correct

Mark 1.00 out of 1.00

What type of code can be executed simultaneously on multiple processors?

Select one or more:

- a. dynamically relocated
- b. self-modifying
- c. reentrant ✓
- d. binary

Twoja odpowiedź jest poprawna.

The correct answer is: reentrant

**Question 42**

Correct

Mark 1.00 out of 1.00

The page index table address is stored in:

Select one or more:

- a. page table base register ✓
- b. instruction pointer
- c. segment base register
- d. page register

Twoja odpowiedź jest poprawna.

The correct answer is: page table base register

**Question 43**

Correct

Mark 1.00 out of 1.00

Virtual memory consists of:

Select one or more:

- a. primary memory and cloud storage
- b. cache memory and mass storage
- c. primary memory and cache
- d. primary and mass memory ✓

Twoja odpowiedź jest poprawna.

The correct answer is: primary and mass memory

**Question 44**

Correct

Mark 1.00 out of 1.00

Dynamic relocation is performed by:

- a. Linker
- b. Loader
- c. Compiler
- d. Special registers (DATUM) ✓

The correct answer is: Special registers (DATUM)

**Question 45**

Correct

Mark 1.00 out of 1.00

Compaction solves the problem:

Select one or more:

- a. external fragmentation ✓
- b. internal fragmentation
- c. page fault
- d. swapping

Twoja odpowiedź jest poprawna.

The correct answer is: external fragmentation

**Question 46**

Incorrect

Mark 0.00 out of 1.00

Internal fragmentation can be removed by:

Select one or more:

- a. Movement of allocated blocks in memory
- b. Transferring allocated memory blocks to disk
- c. The use of the "onion" algorithm
- d. Allocating unused portions of memory within blocks to other programs ✗
- e. No response from the others

Twoja odpowiedź jest niepoprawna.

The correct answer is: No response from the others

**Question 47**

Incorrect

Mark 0.00 out of 1.00

The combination of paging and segmentation consists in:

Select one or more:

- a. identifying segments with pages ✗
- b. dividing pages into segments
- c. the use of a segment table or a pool of segment registers treated as an additional, superior level of paging ✓
- d. Generating a "frame error" interrupt when the frame containing the page does not belong to the current segment

Twoja odpowiedź jest niepoprawna.

The correct answer is: the use of a segment table or a pool of segment registers treated as an additional, superior level of paging

**Question 48**

Correct

Mark 1.00 out of 1.00

Scheduling algorithms can be:

- a. preemptive ✓
- b. interrupting
- c. indulgent ✓
- d. term changing

The correct answers are: indulgent, preemptive

**Question 49**

Correct

Mark 1.00 out of 1.00

Discontinuous allocation is the result of:

Select one or more:

- a. relocation
- b. segmantation ✓
- c. compaction
- d. paging ✓

Twoja odpowiedź jest poprawna.

The correct answers are: paging, segmantation

**Question 50**

Correct

Mark 1.00 out of 1.00

Multi-threading on a multi-processor machine:

- a. increases concurrency ✓
- b. can increase or decrease concurrency
- c. does not affect concurrency
- d. reduces concurrency

The correct answer is: increases concurrency

**Question 51**

Correct

Mark 1.00 out of 1.00

The environment in which the process is executed includes:

Select one or more:

- a. A set of environment variables ✓
- b. The content in the memory management unit
- c. Process address space ✓
- d. Contents of the interrupt request register

Twoja odpowiedź jest poprawna.

The correct answers are: A set of environment variables, Process address space

**Question 52**

Incorrect

Mark 0.00 out of 1.00

The algorithm in which the most recently used page is swapped out is called (enter the abbreviation if applicable):

Answer: MRU(Most Recently Used)



The correct answer is: LRU

**Question 53**

Correct

Mark 1.00 out of 1.00

What does the kernel do when there is no task (process) to run?

Select one or more:

- a. switches off the power supply
- b. executes an infinite loop in the kernel until a task arrives
- c. resets the entire system
- d. starts the idle task ✓

Twoja odpowiedź jest poprawna.

The correct answer is: starts the idle task

**Question 54**

Partially correct

Mark 0.50 out of 1.00

On UNIX, the number of files is directly limited by:

Select one or more:

- a. The number of bits of the field describing the size of the file
- b. The number of bits of the disk address
- c. The size of the space allocated for files
- d. I-node table size ✓
- e. Allocation unit size

Twoja odpowiedź jest częściowo poprawna.

You have correctly selected 1.

The correct answers are: I-node table size, The size of the space allocated for files

**Question 55**

Incorrect

Mark 0.00 out of 1.00

The following situations trigger "error" exceptions:

Select one or more:

- a. extracode ✗
- b. attempting to execute in user mode an instruction that is only legal in system mode
- c. attempting to execute an illegal instruction ✓
- d. page fault (also known as frame fault, frame error, page miss)

Twoja odpowiedź jest niepoprawna.

The correct answers are: attempting to execute an illegal instruction, attempting to execute in user mode an instruction that is only legal in system mode

**Question 56**

Correct

Mark 1.00 out of 1.00

Round-robin scheduling is the best mechanism for:

Select one or more:

- a. real-time system
- b. time-sharing system ✓
- c. every system
- d. system with different classes of tasks

Twoja odpowiedź jest poprawna.

The correct answer is: time-sharing system

**Question 57**

Correct

Mark 1.00 out of 1.00

The internal state of the program supervisor layer is available for:

- a. OS kernel ✓
- b. File system layer
- c. User programs
- d. Applications

The correct answer is: OS kernel

**Question 58**

Correct

Mark 1.00 out of 1.00

The following situations cause the exceptions (processor internal interrupts) of the "error" type:

Select one or more:

- a. memory reference in the area of the page that is not in memory
- b. an attempt to write to the page for which the "read only" bit is set ✓
- c. memory reference beyond limit register value ✓
- d. a reference to memory that is not in the address space ✓

Twoja odpowiedź jest poprawna.

The correct answers are: a reference to memory that is not in the address space, memory reference beyond limit register value, an attempt to write to the page for which the "read only" bit is set

**Question 59**

Correct

Mark 1.00 out of 1.00

Semaphores are used to solve the problem:

- a. process scheduling
- b. races
- c. Belady problem
- d. mutual exclusion ✓

The correct answer is: mutual exclusion

**Question 60**

Correct

Mark 1.00 out of 1.00

A memory management technique in which the system divides memory into equal-sized portions to easily manage relocation is called:

Select one or more:

- a. mapping
- b. sweeping
- c. swapping
- d. paging ✓

Twoja odpowiedź jest poprawna.

The correct answer is: paging

**Question 61**

Correct

Mark 5.00 out of 5.00

What is the average time in the system for tasks in the batch, using SJF algorithm?

task	1	2	3	4
processing time	3.7	5.3	2.3	1.3

Answer:

6.2



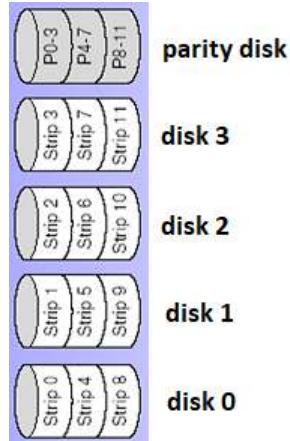
The correct answer is: 6.2

**Question 62**

Incorrect

Mark 0.00 out of 5.00

In RAID 4, data is placed in Strips that are "scattered" over the data disks, so that each subsequent strip is on the next data disk, modulo the number of disks. For this, there is a parity disk that holds the parity bits of zeroth bits, first bits, second bits, etc., equal-numbered strips divided by the number of data disks, for example, strips 0-3, 4-7, 8-11, etc.:



the start of strips 0,1,2,3 looks like this:

1	1	1	0	0	Parity disk
0	0	0	0	0	Disk 3
1	0	0	1	0	Disk 2
1	1	0	1	0	Disk 1
0	1	1	0	0	Disk 0

In the parity strip, the values are placed so that the parity bit keeps the corresponding strip bits 0-3 even.

Disk 3 has been damaged and reads only 0. After replacing the disk with a new one, what values should be put in the strip on disk 3?

Answer:  ✖

The correct answer is: 11000

**Question 63**

Correct

Mark 5.00 out of 5.00

The virtual address consists of 8b page number and 8b offset. The page index table is shown below (index, content). For decimal address 416, binary 0000 0001 1010 0000, enter the physical address in the form: frame number.offset (as decimal numbers, offset in 3 digits). For example, for a physical address consisting of frame 0 and offset 18, specify 0.018. If there is no physical address for the given virtual address, then -1 should be specified.

7	4
6	5
5	-1
4	11
3	6
2	9
1	-1
0	1

Answer:  

The correct answer is: -1.000