Started on	Monday, 16 June 2025, 10:22 AM
State	Finished
Completed on	Monday, 16 June 2025, 11:44 AM
Time taken	1 hour 21 mins
Marks	36.00/40.00
Grade	**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?

- [x] a. Threads minimize context switch time.
- [x] b. A multiprocessor kernel can be concurrent
- [ ] c. The shared context forces threads to run on the same processor
- [x] 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
- [x] 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:

- [x] 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: 0

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 τ for the workset is 3 (the threshold 96-τ=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: 7

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: 11000

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: 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 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: 3

===== 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: 32

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: .1100

The correct answer is: 0.1100