Started on	Tuesday, 10 December 2019, 11:08 AM
State	Finished
Completed on	Tuesday, 10 December 2019, 1:43 PM
Time taken	2 hours 34 mins
Marks	62.00/94.00
Grade	**65.96** out of 100.00

Information

SECTION 1. True or False questions (2 points each)

Question **1**

Correct

Mark 2.00 out of 2.00

Internal fragmentation is not possible on a system using simple segmentation.

Select one:

- True ✔
- False

The correct answer is 'True'.

Question **2**

Correct

Mark 2.00 out of 2.00

The best-fit placement algorithm (dynamic partitioning), chooses the block that is closest in size that is equal or larger than the request.

Select one:

- True ✔
- False

The correct answer is 'True'.

Question **3**

Correct

Mark 2.00 out of 2.00

The placement policy (virtual memory) is an important design issue on a system using segmentation.

Select one:

- True ✔
- False

The correct answer is 'True'.

Question **4**

Correct

Mark 2.00 out of 2.00

Prepaging (virtual memory) only brings pages into main memory when a reference is made to a location on the page.

Select one:

- True
- False ✔

The correct answer is 'False'.

Question 5

Incorrect

Mark 0.00 out of 2.00

In a non-preemptive scheduling algorithm, the transition from running to ready is valid.

Select one:

- True ✖
- False

The correct answer is 'False'.

Question 6

Incorrect

Mark 0.00 out of 2.00

The objective of a real-time system is to minimize the deadline of the tasks.

Select one:

- True ✖
- False

The correct answer is 'False'.

Question 7

Incorrect

Mark 0.00 out of 2.00

DMA does not use interrupts

Select one:

- True ✖
- False

The correct answer is 'False'.

Question 8

Correct

Mark 2.00 out of 2.00

In contiguous file allocation, compaction is performed to deal with the external fragmentation problem

Select one:

- True ✔
- False

The correct answer is 'True'.

Information

SECTION 2. Simple choice questions (3 points each)

Question **9**

Correct

Mark 3.00 out of 3.00

A reference to a memory location independent of the current assignment of data to memory is:

Select one:

- a. Relative Address
- b. Physical Address
- c. Logical Address ✔
- d. Absolute Address

The correct answer is: Logical Address

Question **10**

Incorrect

Mark 0.00 out of 3.00

Given a system using dynamic partitioning as a memory management technique, select the free partition that is chosen by the best-fit placement algorithm for a memory request of 16 MB.

Select one:

- a. Free Partition Size = 18 MB
- b. Free Partition Size = 15.9 MB ✖
- c. Free Partition Size = 19 MB
- d. Free Partition Size = 15 MB

The correct answer is: Free Partition Size = 18 MB

Question **11**

Correct

Mark 3.00 out of 3.00

The page replacement algorithm that looks into the future to select the page to be replaced is:

Select one:

- a. FIFO
- b. LRU
- c. Optimal ✔
- d. CLOCK

The correct answer is: Optimal

Question **12**

Correct

Mark 3.00 out of 3.00

In the two-handed clock page replacement algorithm (UNIX SVR4), if the front-hand finds a page with the reference bit equal to zero, then:

Select one:

- a. The frame is locked
- b. The reference bit is set to 1
- c. The reference bit remains unchanged ✔
- d. The page gets replaced

The correct answer is: The reference bit remains unchanged

Question **13**

Correct

Mark 3.00 out of 3.00

Select the function from processor scheduling that deals with virtual memory

Select one:

- a. Medium-term Scheduling ✔
- b. I/O Scheduling
- c. Short-term Scheduling
- d. Long-term Scheduling

The correct answer is: Medium-term Scheduling

Question **14**

Incorrect

Mark 0.00 out of 3.00

Select the parameter used in deadline scheduling that specifies the time a task must begin.

Select one:

- a. Worst case execution time
- b. Completion deadline
- c. Starting deadline
- d. Ready time ✖

The correct answer is: Starting deadline

Question **15**

Incorrect

Mark 0.00 out of 3.00

Select the I/O technique that does not use interrupts.

Select one:

- a. DMA ✖
- b. Programmed I/O
- c. Interrupt-driven I/O
- d. None of the above

The correct answer is: Programmed I/O

Question **16**

Correct

Mark 3.00 out of 3.00

Select the block-oriented device:

Select one:

- a. Printer
- b. Disk ✔
- c. Communications Port
- d. None of the above

The correct answer is: Disk

Information

SECTION 3. File systems (10 points)

Consider a file system with 8K-byte blocks, 2048 blocks on the single indirect level, and an i-node format that has 12 blocks for direct access, 1 block for single indirect access, 1 block for double indirect access. Determine the following parameters:

Question 17
Incorrect
Mark 0.00 out of 2.00

File System Address size (in bits):

Answer: 4096 ✖

The correct answer is: 32

Question 18
Not answered
Marked out of 2.00

Number of blocks for the direct level:

Answer: ✖

The correct answer is: 12

Question 19
Not answered
Marked out of 2.00

Number of bytes for the direct level:

Answer: ✖

The correct answer is: 98304

Question 20
Incorrect
Mark 0.00 out of 2.00

Number of bytes of the first level of indirection:

Answer: 16384 ✖

The correct answer is: 16777216

Question 21
Correct
Mark 2.00 out of 2.00

Number of blocks of the second level of indirection:

Answer: 4194304 ✔

The correct answer is: 4194304

Information

SECTION 4. Page replacement algorithms (15 points)

Question 22

Correct

Mark 5.00 out of 5.00

Page references: 0,1,2,3,4,5,5,4,3,2,1,0

Algorithm: FIFO

Number of Frames: 4

Question 23

Correct

Mark 5.00 out of 5.00

Page references: 0,1,2,3,4,5,5,4,3,2,1,0

Algorithm: LRU

Number of Frames: 4

Question **24**

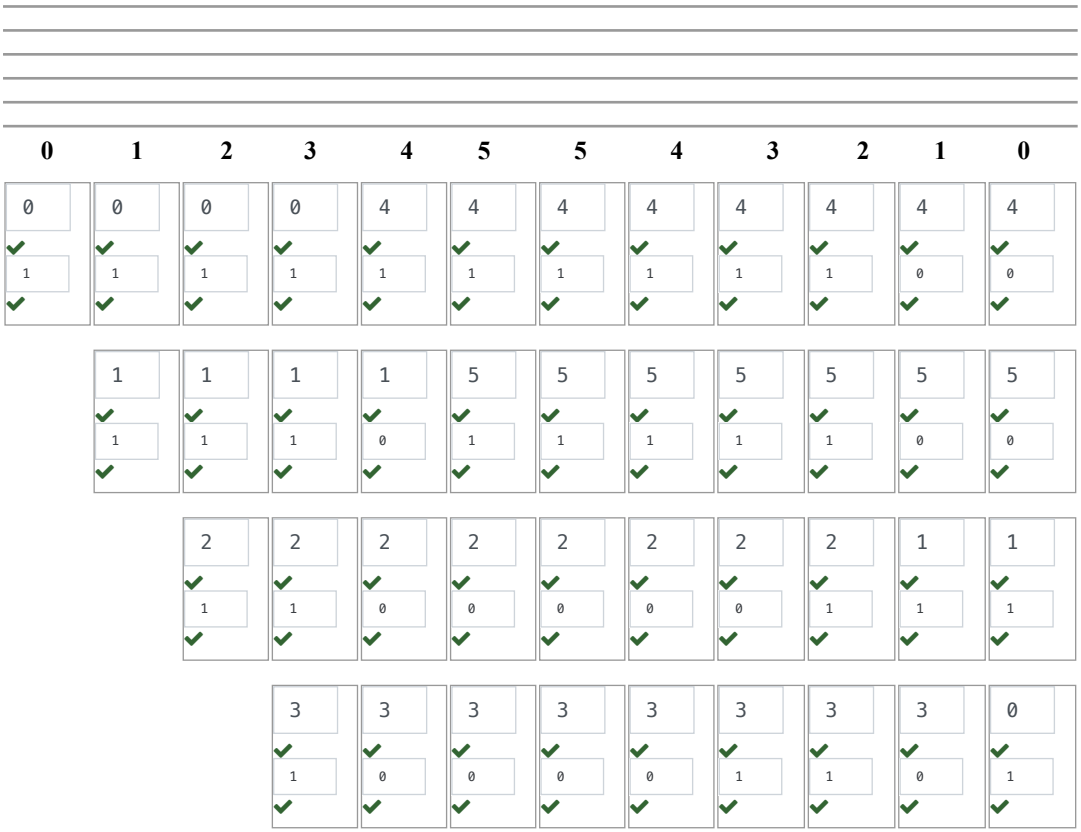
Correct

Mark 5.00 out of 5.00

Page references: 0,1,2,3,4,5,5,4,3,2,1,0

Algorithm: CLOCK

Number of Frames: 4



Information

SECTION 5. Fair-Share scheduling algorithm (10 points)

Question 25

Not answered

Marked out of 4.00

Given a system with two processes (A and B) that are members of Group 1 and Group 2 respectively, execute the Fair-Share scheduling algorithm and complete the following table.

	Group 1			Group 2		
Time	Process A			Process B		
	Priority	Process CPU Count	Group CPU Count	Priority	Process CPU Count	Group CPU Count
0	60	0	0	60	0	0
1	90 ✖	30 ✖	30 ✖	60 ✖	0 ✖	0 ✖
2	74 ✖	15 ✖	15 ✖	90 ✖	30 ✖	30 ✖

You can assume that:

1. The base priority is equal to 60.
2. The processor is interrupted 60 times per time instant (the number of counts of the process that is currently running will be increased).
3. The weight of Group 1 is equal to the weight of Group 2.
4. If the priority of the two processes is the same, you will use the lowest PID criterion (using lexicographical order).

Information

SECTION 6. Uniprocessor scheduling algorithms (25 points)

Question 26

Correct

Mark 5.00 out of 5.00

Execute FCFS for the following group of processes and complete the following table:

Process	A	B	C	D
$T_{Arrival}$	0	2	4	6
T_s	3	5	4	1
T_{Finish}	3 ✔	8 ✔	12 ✔	13 ✔
T_R	3 ✔	6 ✔	8 ✔	7 ✔

If two processes or more processes arrive at the ready queue at the same time, you will use the lowest PID criterion (using lexicographical order).

Question **27**

Incorrect

Mark 0.00 out of 5.00

Execute RR (Q=4) for the following group of processes and complete the following table:

Process	A	B	C	D	E
$T_{Arrival}$	0	2	4	6	8
T_s	2	3	5	1	4
T_{Finish}	2 ✔	5 ✔	15 ✔	10 ✔	14 ✔
T_R	2 ✔	3 ✔	9 ✖	4 ✔	6 ✔

If two processes or more processes arrive at the ready queue at the same time, you will use the lowest PID criterion (using lexicographical order).

Question **28**

Correct

Mark 5.00 out of 5.00

Execute SPN for the following group of processes and complete the following table:

Process	A	B	C	D
$T_{Arrival}$	0	2	4	6
T_s	3	5	4	1
T_{Finish}	3 ✔	8 ✔	13 ✔	9 ✔
T_R	3 ✔	6 ✔	9 ✔	3 ✔

If two or more processes in the ready queue have the shortest service time, you will use the lowest PID criterion (using lexicographical order).

Question **29**

Correct

Mark 5.00 out of 5.00

Execute SRT for the following group of processes and complete the following table:

Process	A	B	C	D
$T_{Arrival}$	0	2	4	6
T_s	3	5	4	1
T_{Finish}	3 ✔	9 ✔	13 ✔	7 ✔
T_R	3 ✔	7 ✔	9 ✔	1 ✔

1. If the process arriving has the same remaining execution time as the process in the CPU, then the process that is using the CPU will have the highest priority.

2. If there is no process in the execution state and two or more processes have the shortest remaining time, then you will use the lowest PID criterion (using lexicographical order).

Question **30**

Correct

Mark 5.00 out of 5.00

Execute HRRN for the following group of processes and complete the following table:

Process	A	B	C	D	E
$T_{Arrival}$	0	2	4	6	8
T_s	2	3	5	1	4
T_{Finish}	2 ✔	5 ✔	10 ✔	11 ✔	15 ✔
T_R	2 ✔	3 ✔	6 ✔	5 ✔	7 ✔

If two or more processes in the ready queue have the highest response rate, you will use the lowest PID criterion (using lexicographical order).