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B.Tech. DEGREE EXAMINATION, MAY 2024
Fourth Semester

18CSC266J – OPERATING SYSTEMS

(For the candidates admitted during the academic year 2018-2019 to 2019-2020)

Note:

- (i) **Part - A** should be answered in OMR sheet within first 40 minutes and OMR sheet should be handed over to hall invigilator at the end of 40th minute.
- (ii) **Part - B & Part - C** should be answered in answer booklet.

Time: 3 hours

Max. Marks: 100

PART – A (20 × 1 = 20 Marks)

Answer **ALL** Questions

	Marks	BL	CO	PO
1. Choose the incorrect operating system types (A) Baton processing systems (B) Time sharing systems (C) Distributed systems (D) Desktop systems	1	1	1	1
2. In operating system, location of the next instruction to be executed is stored at _____. (A) Open files (B) Program counters (C) Process registers (D) Process state	1	1	1	1
3. If a process in a running state and an interrupt occurs. Then, the process goes to _____. (A) Terminated state (B) Waiting state (C) Running state (D) Ready state	1	2	1	1
4. Name the concept in which thread has its own copy of data (A) Thread specific data (B) Thread pool (C) Thread cancellation (D) Thread polling	1	1	1	1
5. Find out the non-preemptive scheduling (A) Round robin (B) FIFO (C) Priority scheduling (D) Multilevel queue scheduling	1	2	2	1
6. The command that prints current working directory is _____. (A) cd (B) mk dir (C) pwd (D) cd...	1	2	2	3
7. The _____ Linux command displays bottom 10 rows. (A) head (B) tail (C) cut (D) display	1	2	2	1
8. The most optimal scheduling algorithm is _____. (A) FCFS (B) Shortest job first (C) Round Robin (D) None of the above	1	4	2	1

9. A process execute the following code: 1 3 3 2
 fork ();
 fork ();
 fork ();
 Find the total number of child process created.
 (A) 5 (B) 6
 (C) 7 (D) 8
10. Choose the hardware based solution for critical section. 1 2 3 1
 (A) Peterson's solutions (B) Semaphore
 (C) Monitor (D) Test and set
11. Name the critical section solution that requires busy waiting 1 2 3 1
 (A) Semaphore (B) Mutex logic
 (C) Peterson's solution (D) Monitor
12. Choose the operations of semaphore 1 2 3 1
 (A) wait () and signal () (B) test () and set ()
 (C) compare () and swap () (D) test () and swap ()
13. Choose the single source deadlock avoiding techniques 1 2 4 1
 (A) Resources allocation graph (B) Bankers algorithm
 (C) Process termination (D) Wait for graph
14. _____ is the solution to external fragmentation problem 1 2 4 1
 (A) Compaction (B) Hole
 (C) Reallocation (D) Termination
15. Choose the address generated by CPU. 1 2 4 1
 (A) Physical address (B) Absolute address
 (C) Logical address (D) Segment address
16. Increasing the RAM of a computer typically improves performance because _____. 1 2 4 1
 (A) Virtual memory increases (B) Larger RAM are faster
 (C) Fewer page faults occur (D) Fewer segmentation faults occur
17. After completion of DMA transfer, the processor is notified by _____. 1 2 5 1
 (A) Acknowledgement signal (B) Interrupt signal
 (C) WMFC signal (D) I/O signal
18. The data in registers of I/O port is _____. 1 2 5 1
 (A) Read by host to get input (B) Read by controller to get input
 (C) Written by host to get input (D) Written by controller to get input
19. Name the disk scheduling policies results in minimum amount of head movement 1 2 5 1
 (A) FCFS (B) Circular scan
 (C) Elevator (D) LIFO

20. Contiguous allocation of a file is defined by _____.
 (A) Disk address of the first block (B) Length and size of the block of length
 (C) Size of the block (D) Total size of the file

PART – B (5 × 4 = 20 Marks)
 Answer ANY FIVE Questions

- | | Marks | BL | CO | PO |
|--------------------------------------------------------------------------------------------------|-------|----|----|----|
| 21. Define interrupts and discuss classes of interrupts. | 4 | 2 | 1 | 1 |
| 22. Describe about the operations on process. | 4 | 3 | 1 | 1 |
| 23. Explain the priority scheduling algorithm with suitable example and write the pros and cons. | 4 | 3 | 2 | 2 |
| 24. Compare multiprocessor scheduling with uniprocessor scheduling. | 4 | 3 | 3 | 1 |
| 25. What is paging? Discuss basic paging technique in detail. | 4 | 3 | 2 | 2 |
| 26. Differentiate fixed length partition with variable length partition. | 4 | 3 | 2 | 3 |
| 27. Compare internal fragmentation with external fragmentation. | 4 | 3 | 2 | 3 |

PART – C (5 × 12 = 60 Marks)
 Answer ALL Questions

- | | Marks | BL | CO | PO |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|----|----|----|
| 28. a. Describe the purpose of system calls and discuss the system calls related to device management and communications in brief. | 12 | 2 | 1 | 1 |
| (OR) | | | | |
| b. Sketch the process control block and detail the various information in the process control block. | 12 | 2 | 1 | 1 |
| 29. a.i. Differentiate pre-emptive and non-pre-emptive scheduling. | 6 | 3 | 3 | 2 |
| ii. Differentiate turn around, response time, waiting time in scheduling. | 6 | 3 | 3 | 2 |
| (OR) | | | | |
| b. Describe multiprocessor scheduling with suitable example. | 12 | 3 | 2 | 3 |
| 30. a.i. Discuss necessary conditions for deadlock. | 6 | 3 | 4 | 2 |
| ii. Describe deadlock prevention and deadlock avoidance techniques. | 6 | 3 | 4 | 2 |
| (OR) | | | | |
| b. Consider a system with five processes P ₀ through P ₄ and three resources types A, B, C. Resource type A has 10 instances, B has 5 instances, and type C has 7 instances. Suppose time to following snapshot of the system has been taken. | 12 | 3 | 4 | 2 |

Process	Allocation			Max			Available		
	A	B	C	A	B	C	A	B	C
P ₀	0	1	0	7	5	3	3	3	2
P ₁	2	0	0	3	2	2			
P ₂	3	0	2	9	0	2			
P ₃	2	1	1	2	2	2			
P ₄	0	2	2	4	3	3			

Find out the need matrix and the safe sequence.

31. a. Discuss about paging and page table structure with suitable example. 12 3 5 3

(OR)

- b. Consider the following page reference string. 12 3 5 3

1 2 3 4 5 3 4 1 6 7 8 7 8 9 7 8 9 5 4 4 5 3

Find out the number of page faults for the following algorithms. Assume four frames and all frames are initially empty.

- (i) LRU (ii) FIFO (iii) Optimal

32. a. Compare the linked list file allocation with indexed file allocation method. 12 3 6 2

(OR)

- b. Describe different directory implementation methods. 12 3 6 2

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