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1112N959

Candidate's Seat No:____

IMSC IT SD Sem.-5 Examination

SMD-506

Operating System

December-2025

Time : 2.30 Hours] [Max.Marks : 70

Instructions:
1. **Attempt all questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**

Q.1		Marks (20)

1.The Buddy System helps reduce:
a) Internal fragmentation b) External fragmentation
c) Memory swapping d) CPU load

2.In Paging, the physical memory is divided into:
a) Pages b) Frames
c) Segments d) Blocks

3. Segmentation divides memory based on:
a) Fixed-size blocks b) Logical units like code and data
c) Power of two d) Contiguous frames

4. In Demand Paging, a page fault occurs when:
a) Page is in memory b) Page is not in memory
c) CPU switches processes d) Disk becomes full

5. The LRU (Least Recently Used) algorithm replaces the page
a) Was used most recently b) Was used least recently
c) Has highest priority d) Is smallest in size

6.The PCB (Process Control Block) does NOT contain:
a) Process ID b) Process State
c) System Clock Time d) CPU registers

7.In Fixed Partition Scheme, internal fragmentation occurs:
a) Process is smaller than partition
b) Process is larger than partition
c) Memory is non-contiguous d) Partition size keeps changing

8.In a Variable Partition Scheme, the main problem is:
a) Internal fragmentation b) External fragmentation
c) No fragmentation d) Swapping delay

9.Compaction is used to:
a) Remove internal fragmentation
b) Reduce external fragmentation
c) Increase degree of multiprogramming d) Load OS faster

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SET B

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10. The Medium-Term Scheduler is mainly responsible for:
a) Process creation
b) Swapping processes in and out of memory
c) Device scheduling d) Process termination

11. The Round Robin algorithm is best suited for:
a) Batch systems b) Real-time systems
c) Time-sharing systems d) Multiprocessing systems

12. In a Multithreaded process, threads share:
a) Stack and registers b) Code, data, and OS resources
c) CPU registers only d) Stack only

13. Which of the following is a disadvantage of User-Level Threads?
a) Simple to implement b) Faster context switch
c) Cannot utilize multiple processors
d) Independent scheduling

14.In real-time systems, the main goal of scheduling is to:
a) Maximize throughput b) Minimize memory usage
c) Reduce response time and meet deadlines
d) Increase CPU utilization

15. The Logical Address is generated by:
a) CPU b) Main Memory
c) Cache d) Secondary Memory

16. System Calls are used to:
a) Communicate between user and kernel
b) Perform only arithmetic operations
c) Compile user programs d) Run background services

17. A process is best defined as:
a) A single line of code b) A program in execution
c) A program stored on disk d) A hardware instruction

18. The PCB (Process Control Block) does NOT contain:
a) Process ID b) Process State
c) System Clock Time d) CPU registers

19. Which of the following is a non-preemptive scheduling algorithm?
a) Round Robin b) Priority Scheduling
c) FCFS d) Shortest Remaining Time

20. The Short-Term Scheduler is also known as:
a) Job Scheduler b) Dispatcher
c) Queue Manager d) Memory Manager

SET B

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Q.2	What is disk caching? Explain its functionality and advantages.	(10)
	OR	
Q.2	Consider page reference string 1, 3, 0, 3, 5, 6, 3 with 3-page frames. Find the number of page faults using FIFO Page Replacement Algorithm.	(10)
Q.3	Differentiate between paging and segmentation with examples.	(10)
	OR	
Q.3	Explain the critical section problem. Describe software solutions using semaphores or monitors.	(10)
Q.4	Define memory management in operating systems.	(10)
	OR	
Q.4	Describe Banker's algorithm for deadlock avoidance with an example.	(10)
Q.5	Explain different process states with the help of a neat diagram.	(10)
Q.6	What are system calls? List different types of system calls with suitable examples.	(10)

-- Best of Luck --