Avinashilingam Institute for Home Science and Higher Education for Women

Deemed to be University Estd. u/s 3 of UGC Act 1956, Category A by MHRD (now MoE)
Re-accredited with A++ Grade by NAAC. CGPA 3.65/4, Category I by UGC
Coimbatore-641043, Tamil Nadu, India

Bachelor's Degree Examination – November 2025
III Semester

Class : II UG | **Time : 3 Hours**
Major : Computer Applications | **Max. Marks : 100**

23BCAC05 Operating Systems

Course Outcomes:

CO1: Recall the concepts of file management
CO2: Apply security aspects in appropriate situations
CO3: Apply knowledge gained through processor scheduling to other applications
CO4: Analyze features and limitations of operating systems
CO5: Explore various other operating systems

Part A **10 x 1 = 10**
Choose the Correct Answer

1. What does PCB stand for in Operating Systems? CO1K1
   a. Process Control Block
   b. Primary Control Bus
   c. Process Communication Buffer
   d. Protected Code Base

2. Mutual exclusion is used to avoid CO1K1
   a. File corruption
   b. Memory leaks
   c. Race conditions
   d. Deadlock

3. Which memory management technique uses fixed-size blocks? CO2K1
   a. Segmentation
   b. Paging
   c. Contiguous Allocation
   d. Swapping

4. The top level of storage hierarchy is CO2K1
   a. RAM
   b. Cache
   c. Disk
   d. Register

5. In scheduling, turnaround time is the sum of waiting time and CO3K1
   a. Completion time
   b. Response time
   c. Execution time
   d. Arrival time

6. Multiprocessing increases CO3K1
   a. Memory
   b. CPU throughput
   c. I/O devices
   d. Virtual memory

7. Deadlocks can be prevented using CO4K1
   a. Paging
   b. File locks
   c. Resource allocation graph
   d. Scheduling

8. Which file allocation method is easiest to implement? CO4K1
   a. Indexed
   b. Linked
   c. Contiguous
   d. Hashed

9. ACL stands for CO5K1
   a. Application Control Logic
   b. Access Control List
   c. Automated Control Layer
   d. Audit Control Log

10. Which OS is open source and widely used in servers? CO5K1
   a. Windows
   b. macOS
   c. Linux
   d. Unix

Part B — 5 x 6 = 30

Answer ALL questions

Each answer should not exceed 400 words or two pages

11.a.Define Process Control Block and explain its components.	CO1K2
(or)	
11.b. Describe the different process states with a state transition diagram	CO1K2
12.a. Explain memory hierarchy.	CO2K1
(or)	
12.b. Explain memory management strategies.	CO2K2
13.a. Compare First-Come-First-Serve and Shortest Job First scheduling algorithms.	CO3K4
(or)	
13.b. Calculate average waiting time for Round Robin scheduling	CO3K3
14.a. State and explain the four necessary conditions for deadlock	CO4K1
(or)	
14.b. Discuss methods of deadlock prevention with examples.	CO4K2
15.a. Define Access Control List and mention its role in OS protection	CO5K1
(or)	
15.b. Explain user authentication methods used in Linux and Windows.	CO5K2

Part C — 5 x 12 = 60

Answer ALL questions

Each answer should not exceed 800 words or four pages

16.a. Explain the process synchronization problem. How semaphores help solve the critical section problem?	CO1K4
(or)	
16.b. Describe various CPU scheduling algorithms with examples. Compare their performance.	CO1K4
17.a. Discuss about paging with direct mapping and pure associative mapping.	CO2K4
(or)	
17.b. Explain memory management techniques with a focus on paging and segmentation.	CO2K4
18.a. Classify the architecture of multiprocessor systems and explain Interconnection schemes.	CO3K4
(or)	
18.b. Differentiate between sequential and parallel processing. Discuss fault tolerance.	CO3K4
19.a. Explain deadlock in operating systems. Describe detection and recovery strategies.	CO4K2
(or)	
19.b. Describe file organization methods and explain file allocation techniques.	CO4K5
20.a. Explain operating system security principles. Describe user authentication and protection mechanisms.	CO5K6
(or)	
20.b. Compare security and protection mechanisms in linux and windows operating systems.	CO5K6

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