Question Paper Code	14085

B.E. / B.Tech. - DEGREE EXAMINATIONS, NOV / DEC 2025

Third Semester

Artificial Intelligence and Machine Learning

24AMPC303 - OPERATING SYSTEM

Regulations - 2024

Duration: 3 Hours

Max. Marks: 100

PART - A (MCQ) (10 × 1 = 10 Marks)
Answer ALL Questions

		Marks	K – Level	CO
1.	What is the primary advantage of using interrupts for handling hardware events in an operating system? a) Improved system security b) Reduced CPU overhead c) Enhanced system stability d) Faster execution of system calls	1	K1	CO1
2.	System calls are usually invoked by _____ a) Polling b) Indirect jump c) Software interrupt d) Hardware interrupts	1	K1	CO1
3.	Which of the following is NOT a process state? (a) New b)Running c)Waiting d) Blocked	1	K1	CO2
4.	Process control block (PCB) contains which of the following: a) List of open files b) Process state c) Process id d) All of the above	1	K1	CO2
5.	Which condition must be eliminated to prevent circular wait? a) Mutual Exclusion b) Hold and Wait c) No Preemption d) Circular Wait	1	K1	CO3
6.	Which scheduling algorithm can contribute to deadlocks? a) Round Robin b) Shortest Job Next c) First Come First Serve d) Priority Scheduling	1	K1	CO3
7.	What is the purpose of a page table in memory management? a) To store processes in memory b) To map logical addresses to physical addresses c) To allocate CPU time to processes d) To prevent thrashing	1	K1	CO4

K1 – Remember; K2 – Understand; K3 – Apply; K4 – Analyze; K5 – Evaluate; K6 – Create

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8.	_____ identifies a physical location of required data in a memory. a) Logical Address b) Physical Address c) Neither logical nor physical d) Internet address	1	K1	CO4
9.	The information about all files is kept in the _____ which also resides on secondary storage. a)Disk Structure b)Directory structure c)Array structure d)All of the above	1	K1	CO5
10.	Which of the following time stamps need not exist for a file on traditional unix file system a) Access Time b) Modification Time c) Creation Time d) Change Time	1	K1	CO6

PART - B (12 × 2 = 24 Marks)
Answer ALL Questions

11.	List the Services of operating system function.	2	K1	CO1
12.	Describe the actions taken by a kernel to context-switch between processes.	2	K2	CO1
13.	Quote the four situations under which CPU scheduling decisions take place.	2	K2	CO2
14.	Define process control block.	2	K1	CO2
15.	What are the requirements that a solution to the critical section problem must satisfy?	2	K1	CO3
16.	Explain preemption help in deadlock prevention?	2	K2	CO3
17.	Distinguish between logical and physical addresses.	2	K2	CO4
18.	What circumstances does Page Fault occur? Describe the actions taken by the OS when Page fault occurs?	2	K1	CO4
19.	How free-space is managed using bit vector implementation? List its advantages.	2	K2	CO5
20.	What are the different accessing methods of a file?	2	K1	CO5
21.	Illustrate Android OS with example.	2	K2	CO6
22.	What are the requirements for Linux system administrator?	2	K1	CO6

PART - C (6 × 11 = 66 Marks)
Answer ALL Questions

23.	a) i) Infer and Illustrate the system components of an operating system in detail.	11	K2	CO1
	OR			
	b) i) Explain the purpose of system calls and discuss the calls related to device management and communications in brief.	11	K2	CO1

24.	a) Explain the FCFS, preemptive and non-preemptive versions of Shortest-Job First and Round Robin (time slice = 2) scheduling algorithms with Gantt charts for the four Processes given. Compare their average turnaround and waiting time.	11	K2	CO2

Process	Arrival Time	WaitingTime
P1	0	8
P2	1	4
P3	2	9
P4	3	5

K1 – Remember; K2 – Understand; K3 – Apply; K4 – Analyze; K5 – Evaluate; K6 – Create

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OR

b) Explain in detail about the inter process communication.   *11*   *K2*   *CO2*

25. a) Develop the critical section problem and also write the algorithm for Readers-Writers Problem with semaphores.   *11*   *K3*   *CO3*

OR

b) Consider the following snapshot of a system: *11*   *K3*   *CO3*

P0 – P4 are 5 processes present and A, B, C, D are the resources. The maximum need of a Process and the allocated resources details are given in the table.

Answer the following based on banker's algorithm.

What is the content of NEED matrix?

Is the system in a safe state?

If a request from process P0 arrives for (0,2,0) can the request be granted immediately

	Allocation			Max			Available		
	A	B	C	A	B	C	A	B	C
P0	0	1	0	7	5	3	3	3	2
P1	2	0	0	3	2	2			
P2	3	0	2	9	0	2			
P3	2	1	1	2	2	2			
P4	0	0	2	4	3	3			

26. a) Explain the principles of segmented and paging implemented in memory with a diagram.   *11*   *K2*   *CO4*

OR

b) Discuss the given memory management techniques with diagrams.   *11*   *K2*   *CO4*
   i) Partition Allocation Methods
   ii) Paging and Translation Look-aside Buffer

27. a) Compare the functionalities of FCFS, SSTF, SCAN AND C-LOOK disk scheduling algorithms with an example for each.   *11*   *K2*   *CO5*

OR

b) Illustrate in detail about the free space management on I/O buffering and blocking.   *11*   *K2*   *CO5*

28. a) With framework explain the working function of android operating system architecture. Compare the feature of IoS and android.   *11*   *K3*   *CO6*

OR

b) Construct the procedure for setting VMware on LINUX host and adding guest OS.   *11*   *K3*   *CO6*