Reg. No.																

Question Paper Code	14636

B.E. / B.Tech. - DEGREE EXAMINATIONS, APRIL / MAY 2026

Third Semester

Computer Science and Engineering(AIML)

24AMPC303 - OPERATING SYSTEM

Regulations -2024

Duration: 3 Hours | Max. Marks: 100

PART – A (i) (MCQ)
(16 × 1 = 16 Marks)
Answer ALL Questions

		Marks	K – Level	CO
1.	Define the primary purpose of interrupts in an operating system. a) To execute system calls b)To handle errors c) To handle asynchronous events d) To manage hardware resources	1	K1	CO1
2.	when the DMA controller interrupts the CPU a) The entire transfer is finished b)A data error occurs c) CPU processing exceeds a threshold d) An external interrupt is detected	1	K1	CO1
3.	Recall how system calls are usually invoked. a) Polling b)Indirect jump c) Software interrupt d)Hardware interrupts	1	K1	CO1
4.	Select the option that is NOT a process state. a) New b) Running c) Waiting d) Blocked	1	K1	CO2
5.	Explain which IPC mechanism provides the fastest data sharing between processes a) Pipes b) Message Passing c) Shared Memory d)Signals	1	K2	CO2
6.	Name the scheduler responsible for context switching. a) Long-term scheduler b) Short-term scheduler c)Medium-term scheduler d) Dispatcher	1	K1	CO2
7.	Match the algorithm commonly used for deadlock avoidance a) Round Robin Scheduling b)Banker's Algorithm c) FIFO Scheduling d) Shortest Job First	1	K1	CO3
8.	Choose the graph used for detecting deadlocks. a) Process Control Block b) Resource Allocation Graph c) Execution Graph d) Priority Graph	1	K1	CO3
9.	Interpret what happens when a system enters an unsafe state. a) Deadlock has already occurred b)Deadlock will definitely occur c) The system may enter deadlock if resources are allocated incorrectly d) The system cannot execute any process	1	K2	CO3
10.	Name the Segmentation, a process address space is broken in varying sized blocks called a) Sections b) Pages c) Blocks d) None of the mentioned	1	K1	CO4

11.	Recall the condition caused when a process accesses a page not present in memory.		*1*	*K1*	*CO4*
	a) Page hit	b) hardware fault			
	c) frame fault	d) page fault			
12.	Summarize the process of swap-out in memory management.		*1*	*K2*	*CO4*
	a) to remove a process from RAM and adding to hard disk	b) to remove a process from RAM			
	c) to add a process to hard disk	d) to add a process to RAM			
13.	Classify the structure that stores information about all files in an operating system		*1*	*K2*	*CO5*
	a) Disk Structure	b) Directory structure			
	c) Array structure	d) All of the above			
14.	Explain the purpose of the file-open count in a file system		*1*	*K2*	*CO5*
	a) File Pointer	b) File-open count			
	c) Disk location of the file.	d) Access rights			
15.	State what Linux is primarily known as		*1*	*K1*	*CO6*
	a) A web server	b) An operating system			
	c) A programming language	d) A hardware platform			
16.	Demonstrate which API is mainly used for displaying Google Maps in an Android application.		*1*	*K2*	*CO6*
	a) Fused Location Provider API	b) Maps SDK for Android			
	c) Geofencing API	d) LocationManager API			

PART – A (ii) (Short Answer Questions)
(6 × 3 = 18 Marks)
Answer ALL Questions

17.	Explain the functions of an operating system.	*3*	*K2*	*CO1*
18.	Illustrate the process state diagram with suitable state transitions.	*3*	*K2*	*CO2*
19.	Summarize the concept of Demand Paging in memory management.	*3*	*K2*	*CO3*
20.	Identify the role of a Resource Allocation Graph in deadlock detection.	*3*	*K3*	*CO4*
21.	Apply suitable disk-scheduling algorithms for efficient disk access management.	*3*	*K3*	*CO5*
22.	Demonstrate the use of Android OS features in a real-time mobile application example.	*3*	*K3*	*CO6*

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

23.	a)	Develop a detailed explanation on the evolution of operating systems and their significance in modern computing.	*11*	*K3*	*CO1*
		OR			
	b)	Utilize various system calls in operating system services with suitable examples	*11*	*K3*	*CO1*
24.	a)	Construct a detailed explanation of inter-process communication methods used in operating systems.	*11*	*K3*	*CO2*
		OR			

b) Solve the given scheduling problem using FCFS, SJF (Preemptive), Round Robin (Time Quantum = 2), and Priority Scheduling algorithms, and determine the Gantt chart, average turnaround time, and average waiting time. *11 K3 CO2*

Process	Arrival Time	Burst time	Priority
P1	0	10	2
P2	1	6	3
P3	2	12	1
P4	3	15	4

25. a) Build the following system snapshot using data structures in the Banker's algorithm with resources A, B,C and D and process P0 to P4: *11 K3 CO3*

	Max	**Allocation**	**Available**
	A B C D	A B C D	A B C D
P0	6 0 1 2	4 0 0 1	3 2 1 1
P1	1 7 5 0	1 1 0 0	
P2	2 3 5 6	1 2 5 4	
P3	1 6 5 3	0 6 3 3	
P4	1 6 5 6	0 2 1 2	

Using Banker's algorithm, answer the following questions:
(i)What are the contents of the need matrix?
(ii) Is the system in a safe state? Why?
(iii) If a request from process P4 arrives for additional resources of (1,2,0,0) can the banker's algorithm grant the request immediately? Show the new system state and other criteria

OR

b) Identify the differences between the Wait-for Graph method and Resource Allocation Graph method used in deadlock detection. *11 K3 CO3*

26. a) Model the working principle of segmentation in memory management with suitable illustrations. *11 K3 CO4*

OR

b) Solve the given page reference string: 1, 2, 3, 4, 5, 3,4,1,6,7,8,7, 8, 9, 7, 8, 9, 5, 4, 4, 5, 3 How many page faults would occur for the following replacement algorithms, assuming four frames? Remembering all frames are initially empty. *11 K3 CO4*
i) LRU replacement
ii) FIFO replacement
iii) Optimal replacement.

11 K3 CO5

27. a) Organize the steps involved in file system mounting with suitable examples.

OR

b) Select and Compare appropriate disk scheduling algorithms among FCFS, SSTF, C-SCAN, and C-LOOK for efficient disk access operations. *11 K3 CO5*

28. a) Construct the architecture of the Android operating system and explain its major components. *11 K3 CO6*

OR

b) Utilize Linux I/O management concepts to explain the working of input and output operations in the Linux operating system. *11 K3 CO6*