Course Code: 23AM5D04

BONAM VENKATA CHALAMAYYA INSTITUTE OF TECHNOLOGY & SCIENCE

(AUTONOMOUS)

III - B.Tech I-Semester Supplementary Examinations (BR23), Mar/Apr - 2026

OPERATING SYSTEMS (AI&ML)

Time: 3 hours | Max. Marks: 70

Question Paper consists of Part-A and Part-B

*Answer **ALL** the question in **Part-A and Part-B***

PART–A (10X2 = 20M)

		Marks	CO	BL
1. a)	Define operating system and list its main functions.	(2M)	CO1	BL1
b)	Classify different types of system calls with examples.	(2M)	CO1	BL4
c)	Explain the concept of process control block.	(2M)	CO2	BL2
d)	Show the process state transition diagram with a neat sketch.	(2M)	CO2	BL2
e)	What is process synchronization?	(2M)	CO3	BL1
f)	Explain the overview of deadlock.	(2M)	CO3	BL2
g)	What is thrashing in virtual memory?	(2M)	CO4	BL1
h)	Differentiate between internal and external fragmentation.	(2M)	CO4	BL2
i)	What is file-system mounting? Explain with an example.	(2M)	CO5	BL2
j)	Define free space management in file systems.	(2M)	CO5	BL1

PART–B (5X10 = 50M)

2a.	Describe the evolution and types of operating systems with suitable examples.	(5M)	CO1	BL2
b.	Explain the various operating system services and user interfaces.	(5M)		BL2
	(OR)			
3a.	Discuss the different operating system structures with their advantages and disadvantages	(5M)	CO1	BL2
b.	Illustrate the building and booting process of an operating system.	(5M)		BL3
4a.	Explain the process concept and various operations on processes	(5M)	CO2	BL2
b.	Describe inter-process communication mechanisms with suitable examples.	(5M)		BL2
	(OR)			
5a.	Compare and contrast various CPU scheduling algorithms: FCFS, SJF, Round Robin, and Priority scheduling.	(5M)	CO2	BL4
b.	Discuss multithreading models and thread libraries in detail.	(5M)		BL2
6a.	Explain the critical section problem and Peterson's solution for process synchronization.	(5M)	CO3	BL2
b.	Describe the use of semaphores and monitors in solving synchronization problems	(5M)		BL2
	(OR)			
7a.	Discuss deadlock prevention and deadlock avoidance strategies in detail	(5M)	CO3	BL2
b.	Explain the Banker's algorithm for deadlock avoidance with a suitable example.	(5M)		BL3

8a.	Describe contiguous memory allocation techniques and their limitations	(5M)	CO4	BL2
b.	Explain paging technique and structure of page table in detail.	(5M)		BL2
	(OR)			
9a.	Discuss demand paging and page replacement algorithms: FIFO, LRU.	(5M)	CO4	BL2
b.	Discuss FCFS HDD scheduling algorithm used in storage management.	(5M)		BL2
10a	Explain file system interface including file concept and access methods	(5M)	CO5	BL2
b.	Describe directory structure and directory implementation techniques.	(5M)		BL2
	(OR)			
11a	Discuss various file allocation methods: contiguous, linked, and indexed allocation.	(5M)	CO5	BL2
b.	Explain the goals of protection, protection rings, and access matrix mechanisms.	(5M)		BL2

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