O.P.Code: 23CS0511 | R23 | H.T.No.

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)
B.Tech. III Year I Semester Regular Examinations December-2025
OPERATING SYSTEMS
CSE(Artificial Intelligence & Data Science)

Time: 3 Hours **Max. Marks: 70**

PART-A
(Answer all the Questions 10 x 2 = 20 Marks)

1	a	How is Computer systems divided? List and define.	CO1	L2	2M
	b	What is a System Call?	CO1	L2	2M
	c	Define Process and give its structure in memory.	CO2	L1	2M
	d	Describe Gantt chart with an example.	CO2	L2	2M
	e	Describe Deadlock and the methods to handling them.	CO3	L2	2M
	f	What is Resource-Allocation Graphs? List its properties.	CO3	L2	2M
	g	What is meant by Paging and Page fault?	CO4	L2	2M
	h	What is Seek time and Rotational Latency?	CO4	L2	2M
	i	Give the different layers of file system.	CO5	L1	2M
	j	List the reasons for local file system failures.	CO5	L1	2M

PART-B
(Answer all Five Units 5 x 10 = 50 Marks)

UNIT-I

2	a	Design a boot sequence for an operating system and outline the steps involved in system start up.	CO1	L5	5M
	b	How would you use log files, core dumps, and trace listings to debug a system that is intermittently failing?	CO1	L2	5M

OR

3	a	Imagine you're developing a lightweight open-source operating system. What key design goals would you prioritize, and how would you implement them?	CO1	L4	5M
	b	Illustrate any two operating system structures.	CO1	L3	5M

UNIT-II

4	a	What are scheduling queues in operating systems? and how do they manage processes during execution?	CO2	L2	5M
	b	Describe about the different types of Schedulers in operating system.	CO2	L3	5M

OR

5		Illustrate the scheduling strategy for a modern cloud-based system that effectively handles both CPU-bound and I/O-bound processes using multiple processors.	CO2	L3	10M

UNIT-III

6		Define process synchronization and explain Peterson solution algorithms.	CO3	L3	

OR

7	a	What is Semaphore? Explain its types with example.	CO3	L3	
	b	Explain producer consumer problem using semaphore.	CO3	L3	

UNIT-IV

8		Discuss segmentation in operating system with an example.	CO4	L2	

OR

9	a	Discuss about frame allocation and the algorithms used to achieve it.	CO4	L2	
	b	What is thrashing? Explain the causes of thrashing in detail.	CO4	L3	

UNIT-V

10	a	List and explain the various types of file operations.	CO5	L2	
	b	Describe different file allocation methods in detail.	CO5	L2	

OR

11	a	Analyze the advantages and disadvantages of protection rings.	CO5	L5	
	b	Describe Access matrix and explain its implementation with an example.	CO5	L2	

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