

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)

B.Tech. II Year II Semester Regular & Supplementary Examinations March/April-2026
PRINCIPLES OF OPERATING SYSTEMS
(Computer Science & Information Technology)

Time: 3 Hours

Max. Marks: 70

PART-A

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

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|-----|---|-----|----|----|
| 1 a | What is Booting? List and define its types | CO1 | L1 | 2M |
| b | Name two types of system calls. | CO1 | L1 | 2M |
| c | Differentiate between a program and a process. | CO2 | L2 | 2M |
| d | Name any two thread libraries. | CO2 | L1 | 2M |
| e | Define deadlock in operating systems with an example. | CO3 | L1 | 2M |
| f | What are the three necessary conditions that a solution to the critical section problem must satisfy? | CO3 | L2 | 2M |
| g | What is thrashing? | CO4 | L1 | 2M |
| h | List two types of mass storage devices. | CO4 | L1 | 2M |
| i | What is the goal of protection in OS? | CO5 | L2 | 2M |
| j | List any two file access methods. | CO5 | L1 | 2M |

PART-B

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

UNIT-I

- 2 Describe the main types of computing environments. CO1 L3 10M
- OR**
- 3 a List and Explain the main functions of an operating system with suitable examples. CO1 L2 5M
- b Illustrate any two operating system structures. CO1 L3 5M

UNIT-II

- 4 a Demonstrate Process Control Block with neat diagram. CO2 L2 5M
- b Deploy SRJF CPU Scheduling algorithms for given Problem: CO2 L3 5M

| Process | P1 | P2 | P3 | P4 |
|--------------|----|----|----|----|
| Burst Time | 8 | 10 | 3 | 4 |
| Arrival Time | 0 | 4 | 4 | 10 |

i) Consider a Gantt chart illustrating the execution of these job using SRJF CPU scheduling. ii) Calculate the average waiting time and average turnaround time.

OR

- 5 a Describe about the different types of Schedulers in operating system. CO2 L2 5M
- b Discuss multithreading models with neat diagrams. CO2 L2 5M

UNIT-III

- 6 a Evaluate Producer Consumer problem using semaphore. CO3 L3 5M
- b Describe about Deadlock Prevention Methods. CO3 L2 5M

OR

- 7 a What is Semaphore? Explain its types with example. CO3 L2 5M
- b Apply the Banker's algorithm for deadlock avoidance with an example. CO3 L3 5M

UNIT-IV

- 8 a Interpret the following disk scheduling algorithm with suitable example for FCFS and SSTF. CO4 L3
- b Illustrate the procedure for page fault in demand paging with neat diagram. CO4 L3

OR

- 9 a Consider the following reference string CO4 L3
7,0,1,2,0,3,0,4,2,3,0,3,2,1,2,0,1,7,0,1. Assume there are three frames. Solve LRU replacement algorithm to the reference string above and find out how many page faults are produced. Illustrate the LRU page replacement algorithm in detail.
- b What is swapping in memory management? List its pros and cons. CO4 L3

UNIT-V

- 10 a Describe different file allocation methods in detail. CO5 L2
- b What is meant by Threats? List and describe few. CO5 L2

OR

- 11 Illustrate the different directory structures with pros and cons. CO5 L3

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