2/51

3006E794

Candidate's Seat No:____

M.C.A. Sem.-2 Examination
Operating Systems
June-2025

Time : 3.00 Hours] **[Max.Marks : 50**

Instructions:

- **Write both the Sections in the separate answer book.**
- **Both Sections having equal weightage.**
- **Draw Diagrams wherever necessary.**
- **Make Assumptions wherever necessary.**

SECTION – I

Q-1 **Explain the following.** **09**

1) Deadlock and Starvation
2) Soft Link vs Hard Link
3) Structure of a Page Table

Q-2 **Attempt the following.** **08**

1) Explain the different types of Inter process Communication (IPC) mechanisms with suitable examples.
2) Mention the Scheduling Criteria and Optimization Criteria for Scheduling algorithm? Brief about each.

OR

Q-2 **Attempt the following.**

1) What is the Critical-Section? What is race condition? Which are the requirements for solution to critical-section problem?
2) Write a note on pipes and sockets.

Q-3 What is semaphore? Explain counting and binary semaphore with Sudo code. If S=11 and P() operation performed 6 times and V() operation performed 5 time. What will be the value of S? Explain any one process synchronization problem solution using semaphore. **08**

(P.T.O)

SECTION – II

Q-4 Why is CPU scheduling required? What are limitations of FCFS scheduling? What is Belady's anomaly? How SJF scheduling overcomes it? What is the disadvantage of priority scheduling? Show using example and Gantt chart. **09**

Q-5 **Attempt the following. (Any Two)** **08**

1) What is Contiguous Memory Allocation? Explain its types with advantages and disadvantages.
2) Explain the Structure of RAID Levels (RAID 0, RAID 1, RAID 5). Why is RAID important in storage management?
3) List different Directory Structures used in File Systems. Explain each briefly with diagrams.

Q-6 **Attempt the following. (Any Two)** **08**

1) A disk system has 200(0-199) cylinders, the read/write head is at cylinder 91 and determine the order of head movement for FCFS, SSTF, SCAN and C-SCAN to satisfy the following stream of request. Also answer followings:
    a. Total head travel distance
    b. What is the time taken to satisfy all the requests if it takes 2 milliseconds to move from one cylinder to an adjacent one?
    c. Which algorithm is better?

    Disk request: 95, 180, 34, 119, 11, 123, 62, 64
2) What is paging? Write a brief note on page table, hit and miss, Translation Lookaside Buffer for implementation of paging.
3) List out and explain different services provided by operating systems.

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