

Duration: 3hrs

[Max Marks: 80]

- N.B.: (1) Question No 1 is Compulsory.  
(2) Attempt any three questions out of the remaining five.  
(3) All questions carry equal marks.  
(4) Assume suitable data, if required and state it clearly.

- 1 Attempt any FOUR [20]
- Differentiate between monolithic and microkernel.
  - What is the critical section problem? Mention three conditions that must be satisfied by its solution.
  - Explain different types of thread in Operating System
  - Explain external fragmentation with example
  - Give different file access methods
- 2 a What are system calls? Explain different types of system calls with example. [10]  
b Explain Deadlock and how to prevent it? [10]
- 3 a Consider the following set of processes. [10]

Process	Burst Time	Arrival Time
P1	10	0
P2	5	1
P3	2	2

- Draw Gantt chart for FCFS, SJF(Preemptive) and Round Robin (Quantum=2).  
2. Also calculate average waiting time and turnaround time for above scheduling algorithms.
- Explain how producer consumer problem can be solved using semaphore. [10]
- 4 a Explain the role of PCB. [10]  
b Consider the following page reference string: 4,3,2,1,4,3,5,4,3,2,1,5. Assume frame size=3. How many page faults would occur for FIFO, Optimal and LRU algorithm? [10]
- 5 a How can Resource Allocation Graph be used to detect deadlock in the system? [10]  
b Explain the concept of segmentation with an example. [10]
- 6 a Write a short note on file directory structure. [10]  
b Suppose that a disk drive has 200 Cylinders, numbered 0 to 199. Queue = 98, 183, 41, 122, 14, 124, 65, 67. The drive is currently serving a request at cylinder 54 and the previous request was at cylinder 20. Find total number of head movements needed to satisfy the requests for the FCFS, SSTF and SCAN disk scheduling algorithm? [10]

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