

- N.B. :** (1) Question No. 1 is **compulsory**.
 (2) Attempt any **four** questions out of remaining **six** questions.
 (3) Assume **suitable** data wherever **necessary** and mention it **clearly**.
1. (a) What is system call ? Explain any five system calls. 5
 (b) What is memory partitioning ? Explain different memory partitioning techniques. 5
 (c) Draw and explain five state process model. 5
 (d) Explain effect of page size on performance. 5
 2. (a) What is deadlock ? Explain necessary and sufficient conditions to occur deadlock. 10
 Explain deadlock avoidance, prevention and detection.
 (b) The requested tracks in the order received are – 10
 54, 57, 40, 20, 80, 120, 150, 45, 180
 Apply the following disk scheduling algorithm starting track at 90.
 (i) FCFS (ii) SSTC (iii) CSCAN.
 3. (a) Consider the following set of processes with CPU burst time given in table. 10

Process	Burst Time	Arrival Time
P ₁	08	00
P ₂	10	01
P ₃	05	00
P ₄	06	02

 - (i) Draw Gantt chart for preemptive SJF, non-preemptive SJF and Round Robin (Quantum = 02).
 - (ii) Calculate average waiting time and average turn around time.
 - (b) Explain different file access methods. 10
 4. (a) What is mutual exclusion ? Explain semaphore used for mutual exclusion. 10
 (b) Explain various I/O buffering techniques. 10
 5. (a) What is paging and segmentation ? Explain LRU and FIFO page replacement policies for given page frame sequences. Page frame size is 4. 10
 2, 3, 4, 2, 1, 3, 7, 5, 4, 3, 2, 3, 1
 Calculate Page hit and Page miss.
 (b) Explain critical section problem and its different solutions. 10
 6. (a) Explain LINUX concurrency control mechanism. 10
 (b) What are the characteristics of real-time operating system ? Explain in brief real time scheduling. 10
 7. Write short notes on :- 20
 - (a) User Level and Kernel Level Threads
 - (b) Process Control Block (PCB)
 - (c) Unix File System
 - (d) Virtual Memory.