

**N.B.:**

- 1) Attempt any **FOUR** questions from Section –I and any **TWO** questions from Section –II.
- 2) Figures to the right indicate **FULL** marks.
- 3) Answers to both the sections should be written in **SEPARTE** answer books.

**SECTION-I**

- Q.1** Difference between: (15)  
i) Preemptive scheduling and Non-preemptive scheduling.  
ii) Implicit tasking and explicit tasking.
- Q.2** a) What is synchronization? Explain how semaphore can be used to deal with critical section problem. (08)  
b) Explain the difference between External and Internal fragmentation. How to solve the fragmentation problem? (07)
- Q.3** a) What is scheduler? With a neat diagram explain various types of schedulers. (08)  
b) Explain the memory management with bitmap and linked list. (07)
- Q.4** a) Explain the disk space management in detail. (08)  
b) What is monitor? Explain the format of monitor with example. (07)
- Q.5** Discuss the structure of page table. Explain how logical addresses are translated to the physical addresses with example. (15)
- Q.6** Write short notes on any **TWO** of the following: (15)  
a) Device driver  
b) Security attacks  
c) The shell

**SECTION-II**

- Q.7** What is deadlock? Give the necessary conditions that cause a deadlock situation to occur. Discuss various methods for the prevention of deadlock. (20)
- Q.8** Consider the following processes with CPU run time given in minutes. (20)

Process	Runtime	Priority
P <sub>1</sub>	10	3
P <sub>2</sub>	1	1
P <sub>3</sub>	2	3
P <sub>4</sub>	1	4
P <sub>5</sub>	5	2

Processes has arrived in sequence P<sub>1</sub>, P<sub>2</sub>, P<sub>3</sub>, P<sub>4</sub>, P<sub>5</sub> and at the same time. Explain the following scheduling algorithms and calculate average turnaround time and waiting time in case of:

- i) FIFO      ii) SJF      iii) Priority based preemptive scheduling

- Q.9** For the given system having 60 tracks. Currently head is on track number 32 and moving outside. System want to read the tracks in the following sequence: (20)  
27, 39, 31, 46, 40, 33, 34, 39, 17, 29, 34, 56.  
Explain in detail following algorithms and find out the total tracks movements for the head in case of:  
i) First come first served      ii) Shortest seek time first