

**BACHELOR OF COMPUTER APPLICATIONS (CBCS - 2018 COURSE)**  
**B.C.A. Sem-III : WINTER- 2022**  
**SUBJECT : OPERATING SYSTEMS**

Day : Monday

Time : 10:00 AM-01:00 PM

Date : 28-11-2022

**W-18767-2022**

Max. Marks : 60

**N.B.**

- 1) Attempt any **THREE** questions from Section – I and any **TWO** questions from Section – II.
- 2) Figures to the right indicate **FULL** marks.
- 3) Answer to both the section should be written in the **SAME** answer book.

**SECTION – I**

- Q.1** a) What is Semaphore? Give the characteristics of it. (06)  
b) Explain the time slice scheduling with its merits and demerits. (06)
- Q.2** Differentiate between:  
a) Online operating system and Real time operating system (06)  
b) Contiguous allocation and non-contiguous allocation (06)
- Q.3** a) What do you mean by segmentation? Give the advantages of segmentation over paging system. (06)  
b) What do you mean by page fault? When does page fault occurs? Describe action taken by operating system when a page fault occurs. (06)
- Q.4** a) What is directory? Discuss directory structures in brief. (06)  
b) Explain the concept of DMA. (06)
- Q.5** Write short notes on any **THREE** of the following: (12)  
a) Demand paging  
b) Device controller  
c) Clock page replacement algorithm  
d) Conditional critical region  
e) Virtual machine

**SECTION – II**

- Q.6** What is deadlock? Give the conditions for occurrence of it. Explain how we can prevent deadlock. (12)
- Q.7** Consider the following case. (12)

Job No.	Arrival Time (am)	Priority	Run Time (min)
P <sub>1</sub>	10.00	4	7
P <sub>2</sub>	10.01	1	5
P <sub>3</sub>	10.03	3	2
P <sub>4</sub>	10.06	2	3

Calculate average waiting time and turnaround time in case of:

- a) SJF                      b) PBPS

- Q.8** Suppose the head of moving-hard disk with 200 tracks, numbered 0 to 199 serving a request at track number 143 and moving outside. Following is the queue of requests received at the system. (12)  
86, 147, 91, 177, 94, 150, 100, 175, 130, 139  
Calculate total time required to move all these tracks in case of following disk scheduling algorithms (consider Seek time=0.25 Second):  
a) FCFS                      b) SSTF

\*                      \*                      \*                      \*