

**BACHELOR OF COMPUTER APPLICATIONS (CBCS - 2018 COURSE)**  
**B.C.A. Sem-III : WINTER : 2021**  
**SUBJECT: OPERATING SYSTEMS**

**Day : Tuesday**  
**Date : 11-01-2022**

**W-18767-2021**

**Time : 10:00 AM-01:00 PM**  
**Max. Marks: 60**

**N.B.:**

- 1) Q 4 from Section I is COMPULSORY.
- 2) Answer ANY TWO questions from Q 1, 2, 3 in Section I.
- 3) Answer ANY TWO questions from Q 5, 6, 7 in Section II.
- 4) All question CARRY EQUAL marks.
- 5) Answers to Both the sections should be written in SAME answer book.
- 6) Draw a labeled diagram WHEREVER necessary.

**SECTION - I**

Q.1) Answer the following (6 Marks X 2=12)

- a) Differentiate between online operating systems and real time operating systems.
- b) What is Process? Explain process states transitions with the help of diagram.

Q.2) Answer the following (6 Marks X 2=12)

- a) Explain Design issue for paging system in detail.
- b) What is Semaphore? Explain implementation of queuing implementation of Semaphore.

Q.3) Explain the following (6 Marks X 2=12)

- a) What is security? Explain the design principles for security.
- b) Explain in brief device controller and interrupt handler.

Q.4) Write short notes on the following : Attempt ANY THREE (4 Marks X 3=12)

- a) Client-Server Architecture
- b) Second chance page replacement algorithm
- c) Virtual memory
- d) Critical region
- e) Disk hardware & software

**SECTION - II**

Q.5) Answer the following (12 Marks X 1=12)

Consider the following case.

Processes	In-time (am)	Run time (min.)
P1	9.00	7
P2	9.04	3
P3	9.06	5
P4	9.09	3

Calculate average waiting and average turnaround time in case of:

- a) FCFS
- b) SJF
- c) SRTN

Q.6) Answer the following (12 Marks X 1=12)

Consider the following page a reference string:

0, 3, 4, 2, 1, 0, 3, 0, 2, 0, 1, 4, 3, 2.

Consider the memory with four page frames. Initially all are empty. Find out the total number of page faults occurred in case of :

- a) First come first out
- b) LRU with matrix.

Q.7) Answer the following (12 Marks X 1=12)

Consider a disk drive having 200 cylinders, numbered from 0 to 199. The head is currently positioned at cylinder 53 and moving outside. The following is the queue of request kept in FIFO order:

98, 183, 37, 122, 14, 124, 65, 67, 153, 198.

Calculate total time required to move all these cylinders for each of the following disk scheduling algorithm. (Consider seek time = 0.25 second.)

- 1) FCFS
- 2) SSTF