

M.C.A. SEM-III: (C.B.C.S 2011 & 2012 Course): SUMMER 2019  
SUBJECT: OPERATING SYSTEM CONCEPTS

Day: Tuesday  
Date: 16-04-2019

Time: 2:00 P.M. TO 5:00 P.M.  
Max Marks: 100

S-2019-2169

N.B.

- 1) Answer **ANY FOUR** questions from Section – I and **ANY TWO** questions from Section. – II.
- 2) Figures to the **RIGHT** indicate **FULL** marks.
- 3) Both the sections should be written in **SAME** answer books.

SECTION – I

- Q.1** a) Explain operating system concept in brief. (10)  
b) Explain the concept of client server model. Bring out its advantage. (5)
- Q.2** a) What is a process? Discuss different states of processes with diagram. (10)  
b) Describe time slice scheduling algorithm with its advantages and disadvantages. (5)
- Q.3** a) What is the need of segmentation with paging? Elaborate with suitable example. (10)  
b) Explain the memory management with linked list with its merits and demerits. (5)
- Q.4** What is semaphore? Explain solution to producer consumer problem using semaphore. (15)
- Q.5** What is DMA? Explain the DMA transfer with help of DMA controller. (15)
- Q.6** Write short notes on **ANY TWO** of the following. (15)
- a) Security attacks
  - b) Conditional critical region
  - c) Multiprocessing operating system

SECTION – II

- Q.7** Consider the following case. (20)

Processes	In time (am)	Priority	Runtime (min)
P1	10.00	3	12
P2	10.03	2	7
P3	10.07	4	5
P4	10.09	1	2

Calculate average waiting and average turnaround time in case of :

- i) Shortest job first
- ii) Shortest remaining time next
- iii) Priority based preemptive scheduling

- Q.8** Consider the following page reference string. (20)

1, 2, 3, 4, 5, 6, 2, 1, 2, 3, 5, 6, 3, 2, 4, 2, 3, 6, 7, 4

Assume memory with four physical frames and all are empty initially. How many page faults would occur, if the page replacements are done using FIFO and LRU?

- Q.9** Suppose the head of moving disk with 100 tracks is currently serving a request (20)

at track number 47 and moving inside. Following is the queue of requests kept in the FIFO order.

86, 14, 19, 77, 94, 10, 48, 17, 46, 94, 70, 35, 68

Calculate total time required to move all these tracks using following disk scheduling algorithms. (Consider Seek time = 0.50 sec.)

- i) FCFS
- ii) SSTF