

I.M.C.A. SEM-VII (2014 Course) CBCS : SUMMER - 2019

SUBJECT : OPERATING SYSTEM CONCEPTS

Day : Tuesday  
Date : 16/04/2019

S-2019-2137

Time 02.00 PM TO 05.00 PM  
Max. Marks :100

**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 \_\_\_\_\_ answer books.

**SECTION - I**

- Q.1** Define operating system. List the objectives of operating systems. Also (15) explain the importance and working of real time operating system.
- Q.2** What is a process? Explain structure of process control block and give the (15) process state transition in brief.
- Q.3** What is producer-consumer problem? Discuss the possible solutions to (15) procedure consumer problem.
- Q.4** Explain in detail about file attributes, file operations, file types and file (15) structures.
- Q.5** What is virtual memory? With neat diagram, explain how logical address is (15) translated into physical address using paging mechanism.
- Q.6** Write short notes on any **TWO** of the following (15)
- a) DMA
  - b) Monitors
  - c) Virtual machine

**SECTION - II**

- Q.7** a) Consider the following page reference string: (10)  
0, 3, 4, 1, 2, 0, 3, 2, 1, 0, 4, 0, 1, 2, 3  
How many page faults will occur for following page replacement algorithms assuming four frames and all frames are initially empty.
- i) FIFO
  - ii) Optimal page replacement algorithm
- b) Write about deadlock condition and banker algorithm in brief (10)
- Q.8** Consider the following case: (20)

Process	Run time (Min)	Arrival time
P <sub>1</sub>	10	10.00
P <sub>2</sub>	6	10.03
P <sub>3</sub>	4	10.05
P <sub>4</sub>	3	10.07

Explain the following algorithm and compare their average turnaround time and waiting time in case of:

- i) FIFO
  - ii) Shortest job first
  - iii) Shortest remaining time next
- Q.9** a) Explain various types of system calls with an example for each. (10)
- b) Write a short notes on free space management. (10)