S-165 Roll No. ……..

MCA–11/M.Sc.-IT–11

Operating System

Master of Computer Application/
Master of Science in Information Technology
(MCA/M.Sc.-IT-11/12/16/17)

Third Semester, Examination, 2018

Time : 3 Hours **Max. Marks : 80**

Note : This paper is of **eighty (80)** marks containing **three (03)** Sections A, B and C. Learners are required to attempt the questions contained in these Sections according to the detailed instructions given therein.

Section–A

(Long Answer Type Questions)

Note : Section 'A' contains four (04) long answer type questions of nineteen (19) marks each. Learners are required to answer *two* (02) questions only.

1. Explain the operating system structure. Define the essential properties of the following types of operating systems :
   (a) Batch
   (b) Time sharing
   (c) Real Time
   (d) Distributed

2. What do you understand by page replacement algorithm ? Explain the different page replacement algorithm.
3. Consider the following set of processes, P1, P2, P3, P4, P5 arrived in this order with yjr following CPU burst and priority values :

Process	Burst	Priority
P1	6	4
P2	4	1
P3	2	2
P4	8	2
P5	1	3

   (i) Draw the Gantt chart illustrating the execution of these processes using FCFS, SJF, RR (quantum = 1) algorithms.

   (ii) Calculate the average turnaround time and average waiting time for each type of scheduling. Mention which algorithms have maximum and minimum waiting time and turnaround time.

4. Explain in detail the following :
   (i) Belady's anomaly
   (ii) Segmentation and paging
   (iii) SCAN-disk scheduling algorithm
   (iv) DMA structure

Section–B

(Short Answer Type Questions)

Note : Section 'B' contains eight (08) short answer type questions of eight (08) marks each. Learners are required to answer *four* (04) questions only.

1. Differentiate between hard real time system and soft real time system.

2. Explain about critical regions and monitor.
3. What do you mean by semaphores ? Explain.
4. Define throughput and turnaround time.
5. Differentiate between Internal and External Fragmentation.
6. What is interprocess communication ? Explain.
7. Describe the following :
   (i) Lazy swapper
   (ii) Demand paging
   (iii) Logical address
   (iv) Physical address
8. Compare the following :
   (i) Contiguous and no contiguous memory
   (ii) Caching and spooling

Section–C

(Objective Type Questions)

Note : Section 'C' contains ten (10) objective type questions of one (01) mark each. All the questions of this Section are compulsory.

1. Which of the following scheduling algorithm give the minimum waiting time ?
   (a) FCFS
   (b) SJF
   (c) Round Robin
   (d) On priority
2. Dirty bit is used to show :
   (a) Page with corrupted data

(b) Wrong page in memory

(c) Page that is modified after being loaded in the Cache memory

(d) Page the is less frequently accessed

3. Operating system is :

(a) Collection of hardware components

(b) A collection of input-output devices

(c) A collection of software routines

(d) All of the above

4. Creating a job queue is a function of :

(a) Spooler

(b) Interpreter

(c) Compiler

(d) Drive

5. To avoid the race condition, the number of processes that may be simultaneously inside the critical Section is :

(a) 5

(b) 3

(c) 1

(d) 0

6. Which of the following is non-pre-emptive ?

(a) Round Robin

(b) FIFO

(c) MQS

(d) MQSF

7. Which of the following is not a condition of dead-lock ?
   (a) Mutual exclusion
   (b) No pre-emption
   (c) Hold and wait
   (d) Data transfer

8. Which is the single user operating system ?
   (a) MS-DOS
   (b) UNIX
   (c) XENIX
   (d) LINUX

9. Which operating system reacts in the actual time ?
   (a) Batch system
   (b) Quick response system
   (c) Real time system
   (d) Time sharing system

10. Belady anomaly :
   (a) Optimal replacement
   (b) FIFO
   (c) LRU
   (d) None of the above