 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, 2017

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

Note : This paper is of **eighty (80)** marks containing **three (03)** Sections A, B and C. 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. List *five* services provided by an operating system. Explain how each helps to users ? Also explain batch operating system.
2. What do you understand by scheduling ? Explain the various scheduling algorithms.

3. Consider the following set of processes, P1, P2, P3, P4, P5 arrived in this order with the following CPU burst and priority values :

Process	Burst	Priority
P1	8	4
P2	6	1
P3	1	2
P4	9	2
P5	3	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) File system mounting

(ii) Protection

(iii) File system structure

(iv) File sharing

Section–B

(Short Answer Type Questions)

Note : Section 'B' contains eight (08) short answer type questions of eight (8) marks each. Learners are required to answer *four* (04) questions only.

1. What are the time sharing operating systems ?
2. Explain the deadlock prevention methods.

3. What is meant by paging ? Discuss in detail about structure of page tables with necessary diagram.
4. Explain briefly file attributes, operations, types and file structures.
5. What is the difference between process and thread ? Explain.
6. What is context switching ? Explain with necessary diagram.
7. Describe the following :
   (i) Virtual Machine
   (ii) Process state
   (iii) Process control block
   (iv) Thread
8. Explain the banker's deadlock avoidance algorithm with an illustration.

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 is not a multitasking operating system ?
   (a) DOS
   (b) Windows
   (c) UNIX
   (d) LINUX

2. When you start up the computer the boot up storage at which the BIOS versions manufacturer and data are displayed on the screen monitor is called :

   (a) Bootstrap

   (b) Power on self-test (POST)

   (c) System configuration

   (d) Kernel loading

3. ..... is the layer of a computer system between the hardware and the user program.

   (a) Operating Environment

   (b) Operating System

   (c) System Environment

   (d) None of the above

4. The banker' algorithm is used :

   (a) to rectify deadlock

   (b) to detect deadlock

   (c) to prevent deadlock

   (d) to solve deadlock

5. Belady anomaly occurs in :

   (a) Optimal replacement

   (b) FIFO

   (c) LRU

   (d) Both in FIFO and LRU

6. Disk scheduling includes deciding :
   (a) Which should be accessed next
   (b) Order in which disk access requests must be survived
   (c) The physical location of the file
   (d) The logical location of the file

7. 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 that is less frequently accessed

8. Semaphores are used to show the problem of :
   (a) Race condition
   (b) Process synchronization
   (c) Mutual exclusion
   (d) Belady problem

9. Creating a job queue is a function of :
   (a) Spooler
   (b) Interpreter
   (c) Compiler
   (d) Drive

10. Four necessary conditions for deadlock are non-pre-emption, circular wait, hold and wait and :
   (a) Mutual exclusion
   (b) Race condition
   (c) Buffer overflow
   (d) None of the above