BCA–10

Operating System

Bachelor of Computer Applications

(BCA–11/16/17)

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. (a) Explain the operating system structure and components. Discuss the concept of virtual machines. Explain with diagram. 13

   (b) What are the *three* main purposes of an operating system ? 6

2. What do you understand by paging and segmentation ? What is fragmentation and how do we solve distinct type of fragmentations ? Can we combine paging and fragmentation techniques ? Explain.

3. (a) What is disk management ? Explain in detail how to improve the disk performance. Write a note on protection strategies provided for files. 10

   (b) What is Page Replacement Scheme ? Define LRU algorithm with an example. 9

4. (a) What is process ? Explain states of process with the diagram and discuss the process state transition with diagram. Demonstrate how remote method invocation process works. 7

   (b) It is possible to have a necessarily deadlock condition in a resource allocation graph with a cycle. Explain your answer. 6

   (c) Define Banker's algorithm. 6

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. Define linked file allocation method. What is Access matrix for protection ?
2. Write short notes on the following :
   (a) Lazy swapper
   (b) Demand paging
   (c) Overlay
   (d) Virtual memory
3. Define FIFO, LRU and Optimal page replacement algorithms.
4. Define process control block. Explain with diagram.
5. Explain critical selection problem.

6. What are race conditions and importance of mutual exclusion ? Write a short note on semaphore and monitor.
7. What are the system cells ? Define the various types of system calls provided by the operation system.
8. Explain the basic concept of the Linux systems.

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. A set of processes in deadlock if :
   (a) Each process is blocked and will remain so forever
   (b) Each process is terminated
   (c) All processes are trying to kill each other
   (d) None of the above mentioned
2. Which scheduling algorithm allocates the CPU first to the process that requests the CPU first :
   (a) First-come, first-served scheduling
   (b) Shortest job scheduling
   (c) Priority scheduling
   (d) None of the mentioned
3. In multilevel feedback scheduling algorithm :
   (a) A process can move to a different classified ready queue

(b) Classification of ready queue is permanent

(c) Processes are not classified into groups

(d) None of the mentioned

4. A system is in safe state if :

(a) The system can allocate resource to each process in some order and still avoid a deadlock

(b) There exists a safe sequence

(c) Both (a) and (b)

(d) None of these

5. In FIFO, a page must be replaced :

(a) Oldest page is chosen

(b) Newest page is chosen

(c) Random page is chosen

(d) None of the above mentioned

6. Which one of the following is the address generated by CPU ?

(a) Physical address

(b) Absolute address

(c) Logical address

(d) None of these

7. File type can be determined by :

(a) File name

(b) File extension

(c) File identifier

(d) None of these

8. Physical memory is broken into fixed-sized blocks called :
   (a) Frames
   (b) Pages
   (c) Backing store
   (d) None of these

9. The ..... is used as an index into page table.
   (a) Frame bit
   (b) Page number
   (c) Page offset
   (d) Frame offset

10. External fragmentation will not occur when :
   (a) First fit is used
   (b) Best fit is used
   (c) Worst fit used
   (d) No matter which algorithm is used, it will always occur