

Professional Course Examination, January 2021
(3rd Semester)

BACHELOR OF COMPUTER APPLICATION

Paper No. : BCA/3/CC/13

Subject : (Operating Systems) (Revised)

Full Mark : 75

Time : 3 hours

(PART : A – OBJECTIVE)

(Marks : 25)

The figures in the margin indicate full marks for the questions

SECTION – I

(Marks : 15)

I. Tick (✓) the correct answer in the brackets provided.

(10x1=10)

1. Multiprogramming in computer system increases _____
 - a) Memory ()
 - b) CPU utilization ()
 - c) Cost ()
 - d) None of the above ()

2. Kernel mode of the operating system is also called _____
 - a) System mode ()
 - b) User mode ()
 - c) Supervisor mode ()
 - d) None of the above ()

3. In which scheduling policies, context switching never takes place?
 - a) FCFS ()
 - b) Round Robin ()
 - c) Shortest Job First ()
 - d) None of the above ()

4. Which one of the following is not a valid state of a thread?
 - a) Running ()
 - b) Parsing ()
 - c) Ready ()
 - d) Blocked ()

5. The circular wait condition can be prevented by _____
 - a) Defining a linear ordering of resource types ()
 - b) Using thread ()
 - c) Using pipes ()
 - d) All of the above ()

6. Given a priori information about the _____ number of resources of each type that maybe requested for each process, it is possible to construct an algorithm that ensures that the system will never enter a deadlock state.
 - a) Minimum ()
 - b) Average ()
 - c) Maximum ()
 - d) None of the above ()

7. When memory is divided into several fixed sized partitions, each partition may contain ____
 - a) Exactly one process ()
 - b) At least one process ()
 - c) Multiple processes at once ()
 - d) None of the above ()

8. Logical memory is broken into blocks of the same size called _____
 - a) Frames ()
 - b) Pages ()
 - c) Backing store ()
 - d) None of the above ()

9. File type can be represented by _____
 - a) File name ()
 - b) File extension ()
 - c) File identifier ()
 - d) None of the above ()

10. A relative block number is an index relative to _____
 - a) The beginning of the file ()
 - b) The end of the file ()
 - c) The last written position in file ()
 - d) None of the above ()

II. State whether the statements are True or False. (5x1=5)

1. Threads within the same process can share data with one another by passing pointers to objects on their stacks. (T / F)
2. Memory mapped I/O determines how the pages of an I/O-bound process are mapped to page frames. (T / F)
3. Dispatcher module gives control of the CPU to the process selected by the short-term scheduler. (T / F)
4. Elevator Algorithm is the deadlock avoidance algorithm. (T / F)
5. In indexed allocation method, each file occupies a set of contiguous block on the disk. (T / F)

SECTION – II
(Marks : 10)

III. Answer the following questions.

(5x2=10)

1. a) Define operating system. What is the primary objective of operating system?
OR
b) What are turnaround time and waiting time?
2. a) Define implicit and explicit tasking.
OR
b) Mention two advantages of using threads.
3. a) What are preemptive resource and non-preemptive resource?
OR
b) What are safe state and safe sequence?
4. a) Mention the difference between logical and physical addresses.
OR
b) Mention two advantages of paging.
5. a) What are regular files and character special files?
OR
b) Mention two disadvantages of contiguous allocation of file system.

(PART : B – DESCRIPTIVE)
(Marks : 50)

Answer any **five** questions

1. (a) Discuss in detail the different types of an operating system with examples. **(10)**

OR

(b) Describe the major functions and services provided by an operating system. **(6+4=10)**
2. (a) Define process. Explain process states with a neat and labelled diagram. **(1+5=6)**
(b) Describe semaphore and their service discipline. **(4)**

OR

(c) Explain Round Robin scheduling with a neat diagram. **(5)**
(d) State Readers and Writers problem. Propose a solution for this problem. **(5)**
3. (a) Define deadlock. What are the necessary conditions for deadlock to occur in the system? **(5)**
(b) Explain the concept of resource-allocation graph with an example. **(5)**

OR

(c) Discuss the algorithm for deadlock detection and methods for deadlock recovery. **(6)**
(d) Write short notes on deadlock prevention. **(4)**

4. (a) What is paging? Explain the basic method of paging. (5)
(b) How does segmentation differ from paging? Explain the paged segmentation with an example. (5)

OR

- (c) Discuss FIFO page replacement algorithm. Also, using FIFO algorithm, determine (3+3=6) the number of page fault occurrences for the following reference string with three page frames.
1, 3, 1, 0, 2, 1, 4, 9, 2, 0, 4, 3, 2
(d) Explain how virtual memory is implemented. (4)

5. (a) Describe contiguous, linked and indexed file allocation methods with suitable diagrams. (10)

OR

- (b) Discuss sequential access method of file system. (4)
(c) Name four (4) directory operations. (2)
(d) Explain in brief, the implementation of directories with diagrams. (4)