A–0791

Total Pages : 4 **Roll No. .....**

BCA-10

Bachelor of Computer Application (BCA)

(Operating System)

Examination, June 2025

Time : 2:00 Hrs. Max. Marks : 70

Note* :–** This paper is of Seventy (70) marks divided into Two (02) Sections 'A' and 'B'. Attempt the questions contained in these sections according to the detailed instructions given therein. ***Candidates should limit their answers to the questions on the given answer sheet. No additional (B) answer sheet will be issued.

Section–A

(Long Answer Type Questions) 2×19=38

***Note* :–** Section 'A' contains Five (05) Long-answer type questions of Nineteen (19) marks each. Learners are required to answer any *two* (02) questions only.

1. Differentiate among the following types of OS by defining their essential properties.

   (a) Time sharing system

   (b) Parallel system

   (c) Distributed system

   (d) Real time system.

2. Consider following processes with length of CPU burst time in milliseconds

Process	Burst Time
P1	5
P2	10
P3	2
P4	1

   All process arrived in order p1, p2, p3, p4 all time zero

   (a) Draw Gantt charts illustrating execution of these processes for SJF and round robin (quantum=1).

   (b) Calculate waiting time for each process for each scheduling algorithm.

   (c) Calculate average waiting time for each scheduling algorithm.

3. Explain Peterson's solution for achieving mutual exclusion.

4. Explain the different Disk scheduling algorithms with their comparisons.

5. What is semaphore ? Discuss product-consumer problem with semaphore.

Section–B

(Short Answer Type Questions) 4×8=32

***Note* :–** Section 'B' contains Eight (08) Short-answer type questions of Eight (08) marks each. Learners are required to answer any *four* (04) questions only.

1. List the main difference and similarities between threads and process.

2. What are the features of operating system required for multiprogramming ?

3. What are the objectives and minimal set of requirement for the file management system ?

4. Define Process and process State diagram.

5. What is Segmentation ? Explain with Example.

6. Consider the following page reference string :

1, 2, 3, 4, 5, 3, 4, 1, 6, 7, 8, 7, 8, 9, 7, 8, 9, 5, 4, 5, 4, 2

How many page faults would occur for the following replacement algorithm, assuming four and six frames respectively ?

(a) Page replacement

(b) FIFO page replacement

7. Explain the concept of interprocess communication, and critical-section in detail.

8. Explain about the following page replacement algorithms :

(a) Not Recently Used

(b) Least Recently Used

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