

END TERM EXAMINATION

FIFTH SEMESTER (BCA) JANUARY-2024

Paper Code: BCA-301

Subject: Operating System

Maximum Marks: 75

Time: 3 Hours

Note: Attempt five questions in all including Q.no. 1 which is compulsory. Select one question from each unit.

Q1 Attempt any five: (5x5=25)

- (a) What is an Operating System? Explain all the functions of Operating System.
- (b) What do you mean by Thrashing?
- (c) What do you mean by Scheduling criteria? Explain.
- (d) What are the various file attributes? Explain.
- (e) How Hard Real time System is different from Soft Real time System?
- (f) What are the various types of devices? Explain.

Unit-I

Q2 (a) How many page faults will occur for the following page reference string for 3 page frames using FIFO, LRU and Optimal page replacement algorithms? (7.5)

7, 0, 1, 2, 0, 3, 0, 4, 2, 3, 0, 3, 2, 1, 2, 0, 1, 7, 0, 1

(b) Define Logical Address & Physical Address. (5)

Q3 (a) What is Paging? Explain the hardware support required for Paging with proper diagram. (7.5)

(b) Explain the differences between Internal and External Fragmentation. (5)

Unit-II

Q4 (a) Consider the following set of Processes

PROCESS	ARRIVAL TIME(in ms)	BURST TIME(in ms)	PRIORITY
A	0	3	3
B	1	6	5
C	2	1	2
D	3	4	1
E	4	2	4

(7.5)

Draw Gantt Chart and calculate Average Waiting Time using

- (i) RR(q=1), (ii) Priority Preemptive, and (iii) Preemptive SJF scheduling algorithms. (5)
- (b) Explain Race condition. (5)

Q5 (a) Describe any two Classic Problems of Synchronization. (7.5)

(b) What is the Critical Section Problem? What are the three requirements for its solution? (5)

Unit-III

Q6 (a) Explain all the methods for Deadlock handling. (7.5)

(b) What are the necessary conditions for a Deadlock to occur? (5)

Q7 (a) A disk drive has 50 cylinders, numbered 0 to 49. The drive is currently serving a request at cylinder 15 and previous request was at cylinder 9. The queue of pending requests in FIFO order is 4, 40, 11, 35, 7, 14. (7.5)

Starting from the current head position, what is the total distance (in cylinders) that the disk arm moves using SSTF, C-SCAN and LOOK (5)

(b) Explain the concept of buffering. (5)

Unit-IV

Q8 (a) Describe various File Allocation methods. (7.5)

(b) Discuss various File Access Methods (5)

Q9 Write short notes on the following (Any Three): (12.5)

- (a) Access control
- (b) Single-Level Directory Structure
- (c) Tree-Structured Directories
- (d) Acyclic-Graph Directories

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P.T.O

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