DCCA301

Reg. No. | | | | | | | | |

# III Semester B.C.A. Degree Examination, April - 2023

## COMPUTER APPLICATION

## Operating Systems

## Paper : CA - CIIT

## (NEP Scheme)

**Time : 2½ Hours** **Maximum Marks : 60**

***Instructions to Candidates:***

Answer all the questions.

### PART - A

**I.** Answer any **four** questions. Each carries **2** marks. **(4×2=8)**

1. Define
   a. Process.
   b. Thread.
2. What do you mean by critical section?
3. What is safe state?
4. What is page fault?
5. What are the various file operations?
6. Define Rotational latency.

### PART - B

**II.** Answer any **four** questions. Each question carries **5** marks. **(4×5=20)**

7. Explain the states of a process with a block diagram.
8. What is a system call? Explain its types.
9. Explain producer - consumer problem using semaphores.

**[P.T.O.**

10. Consider the following set of process with CPU burst time and arrival time.

| PID | Arrival time | Burst time (in ms) |
|---|---|---|
| $P_1$ | 0 | 5 |
| $P_2$ | 1 | 7 |
| $P_3$ | 2 | 4 |
| $P_4$ | 3 | 2 |

Draw the Gantt chart illustrating the execution of the process using Round robin algorithm with a time slice of 2 ms. Find average waiting time and turn around time.

11. What is fragmentation? Discuss the different types of fragmentation.

12. Briefly explain the different types of network - based operating system.

## PART - C

**III.** Answer any **four** questions. Each carries **8** marks. **(4×8=32)**

13. Define operating system. Explain the operating system structure with a block diagram.

14. Explain necessary conditions of deadlock. Discuss the methods of handling deadlock recovery.

15. Explain interprocess communication in detail.

16. Consider the following page reference string.

1,3,0,5,6,3 with 3 page frames. Find the number of page faults using FIFO page replacement algorithm.

17. Explain disk scheduling algorithms SCAN and look with suitable graphs.

18. Write short notes on :

a. Resource - Allocation graph. **(4)**

b. Segmentation. **(4)**