Code No: R193205I **R19** **SET - 1**

III B. Tech II Semester Regular Examinations, June-2022

OPERATING SYSTEMS

(**Common to** EEE, ECE)

Time: 3 hours Max. Marks: 75

Answer any **FIVE** Questions **ONE** Question from **Each unit**
All Questions Carry Equal Marks
*****

UNIT-I

1. a) Discuss the key functions and types of operating system. [10M]
   b) What is operating system debugging and booting? [5M]

(OR)

2. a) Explain in detail about various types of System Calls handled by operating system. [8M]
   b) Explain the major activities of operating system in connection with process and memory management. [7M]

UNIT-II

3. a) Explain the role of Process Control Block in operating system and describe its attributes. [8M]
   b) Write the important characteristics of Round Robin Scheduling algorithm. And demonstrate its performance for the following workload in a system with time quantum = 2 units. [7M]

   Consider the set of 5 processes whose arrival time and burst time are given below

Process	Arrival Time	Burst Time
P1	0	5
P2	1	3
P3	2	1
P4	3	2
P5	4	3

   Draw a Gantt chart illustrating the execution of these jobs and also Calculate the average waiting and turnaround times.

(OR)

4. a) Write about the different multithreading models in operating system. [8M]
   b) What is critical section in Readers-Writer's problem? Suggest a fair solution for the Readers-Writers problem. [7M]

UNIT-III

5. a) What is a Page fault? Explain various ways to handle a page fault. [5M]
   b) Explain the Copy-on-write technique and its benefits. [5M]
   c) What is Thrashing? What is the cause of Thrashing? How does the system detect Thrashing? [5M]

(OR)

6. a) A system uses 4 page frames for storing process pages in main memory. Assume that all the page frames are initially empty. Find the number of Page faults, Hit ratio and Miss ratios for Optimal Page replacement algorithm while processing the page reference string given below: [8M]

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

   b) How does Virtual memory impact a computer's performance? Give explanation and also discuss the merits and demerits of virtual memory implementation. [7M]

UNIT-IV

7. a) Describe the necessary conditions for the occurrence of deadlock. [8M]
   b) Why Ostrich algorithm is considered the best solution for deadlock handling? Explain the Ostrich algorithm. [7M]

(OR)

8. a) Briefly explain about Single-level, Two-level and Tree-Structured directory implementations. [8M]
   b) Explain and compare the FCFS and SSTF disk scheduling algorithms. [7M]

UNIT-V

9. a) Briefly explain about Program, System and Network threats. [10M]
   b) How is Cryptography used for Security and Authentication? [5M]

(OR)

10. a) What does the Access control matrix represent? Explain the implementation of Access control matrix. [8M]
    b) Explain the core components of Linux operating system. [7M]

*****