

Reg. No .....

Name .....

23U239

**END SEMESTER EXAMINATION : MARCH 2023**  
**SEMESTER 2: INTEGRATED M.Sc. PROGRAMME COMPUTER SCIENCE**  
**COURSE : 21UP2CRMCP06 : OPERATING SYSTEMS**

*(For Regular - 2022 Admission and Improvement / Supplementary - 2021 Admission)*

Time : Three Hours

**Max. Weightage: 30**

**PART A**

**Answer Any 8 Questions**

1. Initially, at the time of booting, the hardware runs in ----- mode.
2. Name a CPU scheduling algorithm that has the maximum average waiting time for processes.
3. In ----- CPU scheduling, each process is allotted a time quantum to execute.
4. List any two data structures used in banker's algorithm.
5. Define the term concurrent process.
6. In resource allocation graph, a directed edge from process P1 to resource type R1 is called ----- edge.
7. State the significance of a pager with respect to virtual memory.
8. State the function of MMU.
9. In paging, pages are mapped to fixed-sized blocks called -----.
10. The .dll is an example of ----- type of file.

**(1 x 8 = 8 Weight)**

**PART B**

**Answer Any 6 Questions**

11. Discuss briefly about APIs.
12. After illustrating with a Gantt chart, calculate the average waiting time under SJF scheduling for processes P1 to P5 if their burst times are 8, 2, 10, 11, and 5 respectively and have arrived at time 1, 4, 2, 3, and 5 respectively.
13. Discuss briefly the various multithreading models.
14. Comment on Peterson's solution to the critical section problem.
15. Define race condition in process synchronization. Also, mention how can you guard against race condition.
16. Explain Belady's anomaly in page replacement.
17. Explain shared paging.
18. Differentiate between shared locks and exclusive locks on files.

**(2 x 6 = 12 Weight)**

**PART C**

**Answer Any 2 Questions**

19. Explain the function - Storage management of operating system.
20. Discuss the various operations on processes.

21. Give a detailed note on resource allocation graph. Explain how it can be used to detect a deadlock.
22. Given a 32-byte memory size and 4-byte page size, explain how the user's view of memory is mapped to the physical memory.

**(5 x 2 = 10 Weight)**