| PRN: | | Course Code : | PCA102 |
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First Year **MCA** End Semester Examination Winter 2022-23

# Principles of Operating System

Day and Date: Monday 06/02/23 Max Marks: **100**

Time : 10.30am - 01.30pm Duration: **03** hrs

Instructions: All questions are compulsory. Draw neat labeled diagrams wherever necessary.

| | | | Mark | Bloom's Level | CO |
|---|---|---|---|---|---|
| Q.1 | | **Attempt the following** | | | |
| | a) | What is operating system? List and explain roles of operating system. | 08 | L1 | CO1 |
| | b) | What are System calls? Discuss types of system calls. | 08 | L1 | CO1 |
| | | OR | | | |
| | b) | Explain the structure of operating system with diagram. | 08 | L4 | CO3 |
| Q.2 | | **Attempt the following** | | | |
| | a) | Elaborate the concept of process scheduling. | 08 | L3 | CO2 |
| | b) | Define thread and explain multicore programming | 08 | L2 | CO3 |
| | | OR | | | |
| | b) | Discuss inter-process communication with appropriate diagrams.. | 08 | L2 | CO3 |
| Q.3 | | **Attempt any two from the following** | | | |
| | a) | What is meant by CPU Scheduling? What are different CPU Scheduling criteria. | 08 | L1 | CO1 |
| | b) | What are mutex locks? Write the solution to critical section problem using mutex locks. | 08 | L1 | CO1 |
| | c) | Write a note on hardware synchronization. | 08 | L3 | CO2 |
| Q.4 | | **Attempt any two from the following** | | | |
| | a) | Describe following points with respect to deadlock characterization:<br>1) Necessary conditions<br>2) Resource allocation graph | 08 | L2 | CO3 |
| | b) | Elaborate the process of deadlock detection and write a deadlock detection algorithm. | 08 | L2 | CO3 |
| | c) | Explain in detail deadlock prevention. | 08 | L4 | CO3 |
| Q.5 | | **Attempt any Two of the following** | | | |
| | a) | Explain the concept of copy-on-write technique with proper diagrams. | 09 | L4 | CO3 |
| | b) | Describe contiguous memory allocation in detail. | 09 | L3 | CO2 |
| | c) | Explain the following points with respect to disk management:<br>1) Disk formatting<br>2) Boot block<br>3) Bad blocks | 09 | L4 | CO3 |
| Q.6 | | **Attempt any Two of the following** | | | |
| | a) | Explain file system implementation in detail. | 09 | L4 | CO3 |
| | b) | Explain directory and disk structure. | 09 | L4 | CO3 |
| | c) | Discuss free-space management in detail. | 09 | L3 | CO2 |

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