

MCA (Revised)
Term-End Examination
June, 2022

MCS-041 : OPERATING SYSTEMS

Time : 3 hours

Maximum Marks : 100

(Weightage : 75%)

Note : *Question no. 1 is compulsory. Attempt any three questions from the rest.*

1. (a) Write and explain the Bakery Algorithm to handle critical section problem for 'n' processes in process synchronization. 10
- (b) Explain the Bell-LaPadula Model. Also explain the five components of Information Flow Model. 10
- (c) Following is the sequence of page requests :
1, 4, 6, 3, 5, 1, 2, 3, 4, 7, 9, 1, 2
Assume that there are three frames. How many page faults will occur with Least Recently Used (LRU) and First-In-First-Out (FIFO) algorithms ? 10
- (d) Explain the structure of Unix Operating System along with its components. 10

2. (a) State and explain Dining Philosopher's Problem and its corresponding solutions using semaphores (Write the algorithm also). 10
- (b) Discuss a 3-dimensional hypercube system and explain its essential features. 5
- (c) Discuss Inter-Process Communication (IPC) features in WINDOWS 2000 Operating System. 5
3. (a) Write and explain Banker's Algorithm used for Deadlock avoidance. 10
- (b) Define a Remote Procedure Call (RPC). Illustrate and explain its principle of operation. 5
- (c) What is the cause of thrashing ? How does the system detect it and respond to eliminate this problem ? 5
4. (a) Discuss the following non-contiguous disk storage allocation schemes : 10
- (i) Linked allocation
- (ii) Indexed allocation
- (b) Write and explain Ricart-Agrawala's Mutual Exclusion Algorithm for Distributed Operating Systems. 10

5. Write short notes on the following : *4×5=20*

- (a) Pipes and Filters in Unix Operating System
 - (b) Network Operating System
 - (c) File Management in WINDOWS 2000
 - (d) Fault Tolerance in Distributed Operating System
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