62458

Reg. No.

II Semester M.C.A. Degree Examination, December - 2022
COMPUTER SCIENCE
Operating Systems
(CBCS Scheme Y2K20)
Paper: 2 MCA 1

Time : 3 Hours

Maximum Marks : 70

Instructions to Candidates:

Answer ALL Parts.

PART - A

Answer any **FIVE** questions.   (5×6=30)

1. What is Operating System? Explain multiprogramming and time sharing systems.
2. What are system calls? Briefly Point out its types.
3. Define semaphores. Explain Reader-Write problem with semaphore in detail.
4. Describe Mutual Exclusion implementation with TestAndSet().
5. What are monitors? Explain dining Philosopher's solution using monitor.
6. *Describe both internal and external fragmentation problems encountered in a contiguous memory allocation scheme.*
7. Explain swap in and swap out in two process using disk as a backing store.
8. Briefly describe the implementation of Access Matrix.

PART - B

Answer any **FOUR** questions.   (4×10=40)

9. Consider the following snapshot of a system:

Processes	Allocation			Max			Available		
	A	B	C	A	B	C	A	B	C
P0	1	1	2	4	3	3	2	1	0
P1	2	1	2	3	2	2			
P2	4	0	1	9	0	2			
P3	0	2	0	7	5	3			
P4	1	1	2	1	1	2			

a) Calculate the content of the need matrix.
b) Is the system in a safe state?
c) Determine the total amount of resources of each type.   (10)

[P.T.O.

10. a) Consider the following page reference stream: 7, 0, 1, 2, 0, 3, 0, 4, 2, 3, 0, 3, 2, 1, 2, 0, 1, 7, 0, 1. How many page faults would occur for LRU and FIFO replacement algorithms assuming 3 frames? Which one of the above is most efficient? **(6)**

b) Explain demand paging system. **(4)**

11. Consider the following set of processes:

Process	Arrival Time	Burst Time
P1	0	8
P2	1	4
P3	2	9

Draw Gantt Chart and Compute average turnaround time and the average waiting time using FCFS, Pre-emptive SJF and RR (Quantum=4). **(10)**

12. a) Explain Dual Mode Operation with a neat diagram. **(4)**

b) With a neat diagram explain Queueing diagram of Process Scheduling. **(6)**

13. a) List and Explain the goals and principles of security. **(6)**

b) Write a short note on Virtual Machines. **(4)**

14. a) What is System Boot and Context Switch? **(4)**

b) Discuss the features of Linux Operating System. **(6)**