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II Semester M.C.A. Degree Examination, December - 2023

COMPUTER SCIENCE

Operating Systems

(CBCS-Y2K20 Scheme)

PAPER : 2 MCA1

Time : 3 Hours

Maximum Marks : 70

Instructions to Candidates

Answer any Five questions from Section - A

Answer any Four questions from Section -B

SECTION -A

Answer any Five questions. Each question carries 6 Marks.

(5×6=30)

1. Explain the services of operating system.
2. Define process. Explain the states of process.
3. What is system call? Explain types of system calls.
4. What is deadlock? Explain the necessary conditions for deadlock of occure.
5. Write a short note on real time CPU scheduling.
6. A system uses 3 page frames for storing process pages in main memory. It uses LRU page replacement policy. Assume that all the page frames are initially empty. What is the total number of page faults that will occur while processing the page reference string given below? 4, 7, 6, 1, 7, 6, 1, 2, 7, 2
7. Explain various techniques of disk management mass storage structure.
8. Explain the implementation of Access matrix.

SECTION -B

Answer any Four questions . Each question carries 10 Marks.

(4×10=40)

9. a) What is operating system? Explain the different types of operating systems. (6)
b) Write a note on multithreading. (4)

[P.T.O.]





10. a) Consider the following set of processes with given burst time. Draw the Gantt chart and find average waiting time using (6)

i) FCFS

ii) Preemptive SJF

Process	P1	P2	P3	P4	P5
Burst time	6	2	8	3	4
Arrival time	2	5	1	0	4

b) Write a short note on semaphores. (4)

11. Consider the following and check whether the system is safe or not using Bankers algorithm. Determine the sequence in case it is safe.

Processes	Allocation			MAX			Available		
	A	B	C	A	B	C	A	B	C
P ₀	0	1	0	7	5	3	3	3	2
P ₁	2	0	0	3	2	2			
P ₂	3	0	2	9	0	2			
P ₃	2	1	1	2	2	2			
P ₄	0	0	2	4	3	3			

(10)

12. a) Explain Readers - Writers problem for synchronization.

b) Define thrashing. Illustrate different methods to prevent thrashing. (5+5)

13. a) What is File? Explain the file allocation methods. (6)

b) Explain any two disk scheduling algorithms. (4)

14. a) What is domain protection? Explain with an example.

b) What are virtual machines. Explain benefits of creating virtual machine. (5+5)