PAPER ID-411053

Subject Code: KCA203

Roll No: | | | | | | | | | | | | | |

MCA

(SEM II) THEORY EXAMINATION 2023-24

OPERATING SYSTEMS

TIME: 3 HRS **M.MARKS: 100**

Note: 1. Attempt all Sections. If require any missing data; then choose suitably.

SECTION A

1. Attempt *all* questions in brief.

Q no.	Question	Marks	CO
a.	What are the advantages of Multiprocessor systems?	2	1
b.	List the Services of operating system function.	2	2
c.	Define the term trap or exception?	2	1
d.	What is Process control block? List out the data field associated with PCB.	2	2
e.	What are the methods for handling deadlocks?	2	3
f.	Define request edge and assignment edge.	2	3
g.	What is the main function of the memory-management unit?	2	4
h.	What do mean by page fault?	2	4
i.	What are the various file operations?	2	5
j.	What are the allocation methods of a Disk Space?	2	5

SECTION B

2. Attempt any *three* of the following:

Q no.	Question	Marks	CO
a.	Enumerate the different operating system structure and explain with neat sketch.	10	1
b.	Consider the set of 6 processes whose arrival time and burst time are given below- **Process Id** / **Arrival time** / **Burst time** P1 / 0 / 7 P2 / 1 / 5 P3 / 2 / 3 P4 / 3 / 1 P5 / 4 / 2 P6 / 5 / 1 If the CPU scheduling policy is shortest remaining time first, calculate the average waiting time and average turnaround time.	10	2
c.	Explain the RAG representation in Deadlock Detection.	10	3
d.	Consider a swapping system in which main memory contains the following hole sizes in memory order: 10K, 4K, 20K, 18K, 7K, 9K, 12K, and 15K. Which hole is taken for successive segment requests of 12K, 10K, 9K for First Fit? Repeat this exercise for Best-Fit, Worst-Fit, and Next-Fit. Which algorithm makes the most efficient use of memory?	10	4
e.	Explain the Linked list and indexed file allocation methods with neat diagram. Mention their advantages and disadvantages.	10	5

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SECTION C

3. Attempt any *one* part of the following:

Q no.	Question	Marks	CO
a.	Describe the differences between symmetric and asymmetric multiprocessing. What are three advantages and one disadvantage of multiprocessor systems?	10	1
b.	What do you understand by Time-sharing systems? Describe the advantage of time sharing system.	10	1

4. Attempt any *one* part of the following:

Q no.	Question	Marks	CO
a.	Discuss in detail the critical section problem and also write the solution for Readers-Writers Problem with semaphores.	10	2
b.	Explain different process states and its transition with a neat diagram.	10	2

5. Attempt any *one* part of the following:

Q no.	Question	Marks	CO
a.	Define Deadlock? State and explain four conditions that are necessary for deadlocks to occur with neat example.	10	3
b.	Consider the following snapshot of a system: 1. Calculate the content of the need matrix? 2. Is the system in a safe state?	10	3

Processes	Allocation				MAX				Available			
	A	B	C	D	A	B	C	D	A	B	C	D
P0	0	1	1	0	0	2	1	0	1	5	2	0
P1	1	2	3	1	1	6	5	2				
P2	1	3	6	5	2	3	6	6				
P3	0	6	3	2	0	6	5	2				
P4	0	0	1	4	0	6	5	6				

6. Attempt any *one* part of the following:

Q no.	Question	Marks	CO
a.	Explain in briefly and compare, fixed and dynamic memory partitioning schemes.	10	4
b.	Illustrate the page-replacement algorithms use the reference 1,2,3,4,2,1,5,6,2,1,3,7,6,3,2,1,3,6 with 3 page frame. Find number of page fault by using Following algorithms. a) LRU b) Optimal page replacement	10	4

7. Attempt any *one* part of the following:

Q no.	Question	Marks	CO
a.	Describe the file system in detail.	10	5
b.	Suppose that a disk drive has 5000 cylinders, numbered 0 through 4999. The drive is serving a request at cylinder 143. The queue of pending requests, in FIFO order is 86, 1470, 913, 1774, 948, 1509, 1022, 1750, 130 Starting from the head position what is the total distance (in cylinders) that the disk arm moves to satisfy all the pending requests for each of the following disk-scheduling algorithms ? SSTF, LOOK, C-SCAN.	10	5