K. K. Wagh Institute of Engineering Education & Research, Nashik

(An Autonomous Institute From A.Y. 2022-23)

WINTER-2025	
Exam Seat No.:	
Academic Year:2025-2026	Semester:II
Class:PG-I	Program:MCA
Branch Code:M.C.A.	Pattern:2024
Name of Course:Operating System	Course Code:2409515B
Max. Marks:60	Duration:2.30 Hrs.

Instructions: Candidates should read carefully the instructions printed on the Question Paper and on the cover page of the Answer Book, which is provided for their use.

1. This question paper contains _03_page(s).
2. Answer to each new question is to be started on a new page.
3. Assume suitable data wherever required, but justify it.
4. Draw the neat labelled diagrams, wherever necessary.
5. The last columns indicates the Course Outcome and level of Blooms Taxonomy of the Question/sub-question.

Marks CO

Question No. 1

1a) Differentiate between Assembler and Compiler (6) CO1

Question No. 2

2a) Explain multilevel queue scheduling. How is it different from multilevel feedback queue scheduling? (6) CO2

Question No. 3

3a) Consider the following snapshot of a system A,B,C and D are resources and Processes are P0,P1,P2,P3,P4. (8) CO3

1.What is the content of need array?

2. Is the system is in safe state? If yes, give safe sequence.

3. If a request from process P1 arrives for (0,4,2,0) then can it granted immediately.

	Allocation					MAX					Available			
	A	B	C	D		A	B	C	D		A	B	C	D
P0	0	0	1	2		0	0	1	2		1	5	2	0
P1	1	0	0	0		1	7	5	0					
P2	1	3	5	4		2	3	5	6					

P3	0	6	3	2		0	6	5	2					
P4	0	0	1	4		0	6	5	6					

OR

3b) What is the important feature of critical section? State the Readers Writers problem and give solution using semaphore. (8) CO3

3c) Describe deadlock prevention strategies . (8) CO3

OR

3d) Define deadlock. What are the four necessary conditions for deadlock to occur. (8) CO3

Question No. 4

4a) Consider the following page reference string : (8) CO4

7,0,1,2,0,3,0,4,2,3,0,3,2,1,2,0,7,0,1

Analyse number of page faults would occur for the FIFO , LRU and Optimal page replacement algorithm, assuming 3 frames. All frames are initially empty.

OR

4b) Categorize fixed and variable partitioning in contiguous memory management scheme? (8) CO4

4c) Consider the following segment table : (8) CO4

Segment	Base	Length
0	363	500
1	1272	20
2	1675	1500
3	986	240
4	211	130

Simplify physical addresses for the following logical addresses

1. 0,425

2. 2,500

3. 1,150

4. 3,285

5. 4,125

OR

4d) Write a short note on swapping and overlap swapping. (8) CO4

Question No. 5

5a) Compare allocation methods used in a file system. (8) CO5

OR

5b) Categorise various directory structures in detail. (8) CO5

5c) Analyse the following request received for SCAN and C-SCAN disk scheduling algorithm and compute total head movement. Consider current read/write head position as 50. (8) CO5

Request queue : 82,170,43,140,24,16,190

OR

5d) Analyse the following request received for FCFS(First come first serve) and SSTF(shortest seek time first) disk scheduling algorithm and compute total head movement. Consider current read/write head position as 50. (8) CO5

Request queue : 82,170,43,140,24,16,190

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