CONTINUOUS INTERNAL EVALUATION – 2

Dept: AI / CD / CSE	Sem / Div: 3 A & B	Sub: Operating Systems	S Code: BCS303
Date: 19/12/24	Time: 9:30-11:00 AM	Max Marks: 50	Elective: N

Note: Answer any 2 full questions, choosing one full question from each part.

QN		Questions	Marks	RBT	COs
		PART A			
1	a	Explain the following: i. Internal Fragmentation and External Fragmentation. ii. Dynamic Loading and Linking.	5	L2	CO4
	b	Explain paging. Analyze the problem in simple paging technique and show how TLB is used to solve the problem.	10	L2	CO4
	c	Apply Banker's Algorithm to answer the following: i. What is the content of NEED matrix? ii. Is the system in a safe state? iii. If a request from a process P1(0, 4, 2, 0) arrives, can it be granted? Assume that there are 5 processes and 4 types of resources A, B, C, D. At time T_0 we have the following state:	10	L3	CO3

P	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			
2	a	Explain various steps of address binding with the help of a neat diagram.	5	L2	CO4
	b	Explain demand paging in detail. What is page fault? With supporting diagram explain the steps involved in handling page fault.	10	L2	CO4
	c	Apply Banker's Algorithm to answer the following: i. What is the content of NEED matrix? ii. Is the system in a safe state? iii. If a request from a process P1(1, 0, 2) arrives, can it be granted? Assume that there are 5 processes and 3 types of resources A, B, C. Resource type A has ten instances, resource type B has five instances and resource type C has seven instances. At time T_0 we have the following state:	10	L3	CO3

CONTINUOUS INTERNAL EVALUATION – 2

PROCESSES	ALLOCATION			MAX		
	A	B	C	A	B	C
P0	0	1	0	7	5	3
P1	2	0	0	3	2	2
P2	3	0	2	9	0	2
P3	2	1	1	2	2	2
P4	0	0	2	4	3	3

PART B

3	a	Explain the different access methods of files.	5	L2	CO5
	b	Calculate the page faults using FIFO, OPTIMAL, LRU page replacement algorithms for memory with 3 and 5 frames. Consider the page reference string 1, 2, 3, 4, 5, 3, 4, 1, 6, 7, 8, 7, 8, 9, 7, 8, 9, 5, 4, 5, 4, 2.	10	L3	CO5
	c	Apply FCFS, SSTF, SCAN, C – SCAN, LOOK, C – LOOK to calculate the total disk traveled by the disk arm to satisfy the following sequence 95, 180, 34, 119, 11, 123, 62, 64 with the head initially at track 50 and ending at track 199.	10	L3	CO5
		OR			
4	a	Explain the file types and file attributes.	5	L2	CO5
	b	Calculate the page faults using FIFO, OPTIMAL, LRU page replacement algorithms for memory with 3 and 5 frames. Consider the page reference string 1, 2, 3, 4, 2, 1, 5, 6, 2, 1, 2, 3, 7, 6, 3, 2, 1, 2, 3, 6.	10	L3	CO5
	c	Apply FCFS, SSTF, SCAN C – SCAN, LOOK, C – LOOK to calculate the total distance traveled (in cylinders) by the disk arm to satisfy the request, starting from the current head position. Illustrate with figures in each case. A drive has 5000 cylinders numbered 0 to 4999. The drive is currently serving a request at cylinder 143. The queue of pending request in FIFO order is: 86, 1470, 913, 1774, 948, 1509, 1022, 1750, 130.	10	L3	CO5