47 YASH SARANG OS ASSIGNMENT 2 DGAD.

Q1)

-> Once deadlock has been detected, methods that can help for recovery are the following:

① Abort all deadlocked processes - Most common solution adopted by the OS.

② Back up each deadlocked process to some previously defined checkpoint & restart all processes. This requires that rollback and restart mechanism to be built into the system. The risk is that original deadlock may recur.

③ Successively prompt resource until deadlock no longer exists. Cost-based selection should be used & reinvocation of deletion algorithm is required after every premonition. A process that has a resource prompted from it must be rolled back to a point prior to its aquisition of resource.

④ Successively aborted deadlocked processes until deadlock no longer exists. After each abortion, the deletion algorithm must be reinvoked to check deadlock.

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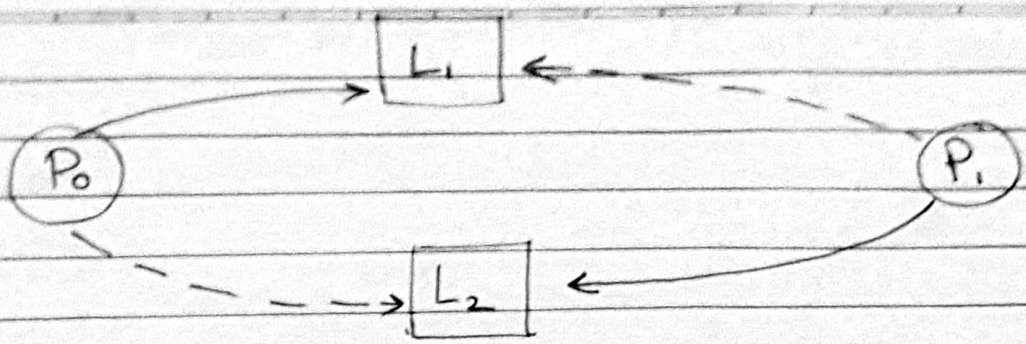
Q2.
→



P_0		P_1
acquire (L_1)	In this method, deadlock is prevented, we can add preemptive to process or add priority so that resource can be allocated as per process priority and then given to the next process.	acquire (L_2)
release (L_1)		release (L_2)
acquire (L_2)		acquire (L_1)
release (L_2)		release (L_1)

Q3.
→ Deadlock can be defined as permanent blocking of set of processes that either compete for system resources. A set of processes is in deadlock when each process set is blocked awaiting an event that can be triggered by another blocked process in set.

* Conditions for deadlock.-

1. Mutual exclusion.
2. No preemption.
3. Hold & wait.
4. Circular wait.

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Q4.

→

	Allocation	Max	Available	Need
	A B C D	A B C D	A B C D	A B C D
P_0	0 0 1 2	0 0 1 2	1 5 2 0	0 0 0 0
P_1	1 0 0 0	1 7 5 0	1 5 3 2	0 7 5 0
P_2	1 3 5 4	2 3 5 6	2 8 8 4	1 0 0 2
P_3	0 6 3 2	0 6 5 2	2 14 11 6	0 0 2 0
P_4	0 0 1 4	0 6 5 6	2 14 12 10	0 6 4 2
			3 14 12 10	

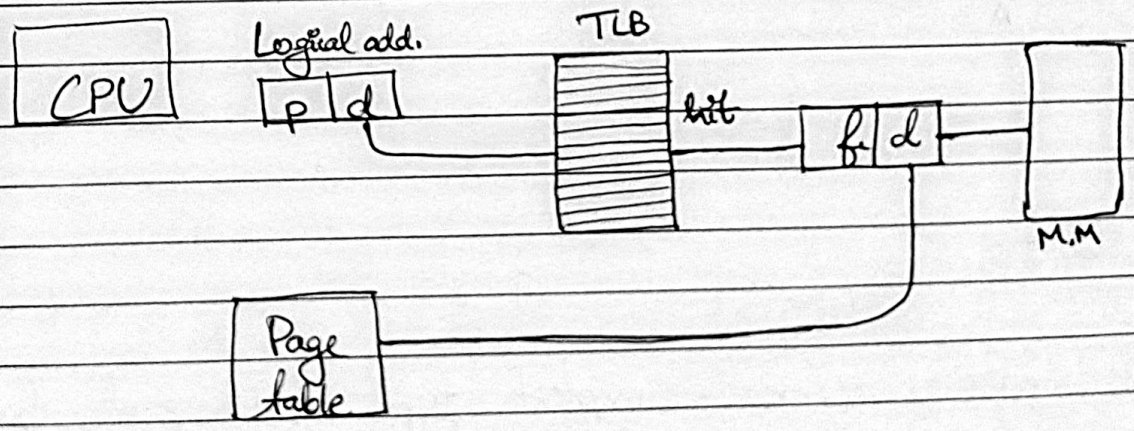
→ P_0 P_2 P_3 P_4 P_1.

∴ System is in safe mode.

∴ Process P_1 can be granted resource immediately as we have 1520 ← available resource.

Q5.

→ TLB is faster than RAM & is of limited size. All the page table entries will be placed in TLB. These are tags which will be used to reach the frame no. If the page is found then it will be TLB hit & we will be able to pick a page from that frame.



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Q7. 98, 183, 37, 122, 14, 124, 65, 67; i = 53

* FIFO → seek time = 641 miliseconds.

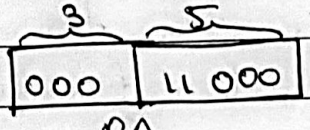
* SSTF → track → 53, 65, 67, 98, 122, 124, 183, 37, 14.
seek time = 300 miliseconds.

* SCAN → track → 53, 65, 67, 98, 122, 124, 183, 37, 14.
seek time = 300 miliseconds.

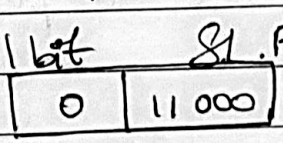
* C-SCAN → track → 53, 65, 67, 98, 122, 124, 183, 14, 37.
seek time = 322 miliscoond.

* LOOK → track → 53, 65, 67, 98, 122, 124, 183, 199, 37, 14.
seek time = 332 miliseeond.

Q8.



158 → 0001011011004



Q 9)
→ 10/Op Buffering techniques:-

i) Single Buffer. - Simplest type of support that O.S can provide is single buffering.

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ii) Double Buffer. - an improvement over single buffering can be had by assigning two system buffers to operation.

iii) Circular Buffer - more than two buffers are used, the collection of buffers is itself reffered to as a circular buffer.

Q10) Dining Philosopher's Problem.

Five philosophers live in a house, where a table is laid for them. The life of each philosopher consists principally of thinking & eating & through years of thought, all of the philosophers had agreed that only food that contributed to their thinking efforts was spaghetti. Due to a lack of manual skill, each philosopher requires two forks to eat spaghetti.

Solution:

We must only allow 4 philosophers at a time to eat and philosophers must take left fork and then fork on right. After eating philosophers will place them back on table on their respective places.

This solution is deadlock & starvation free.

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