

FIFO order, what is the total head movement to satisfy these requests for the following disk scheduling algorithms :

- FCFS
- SSTF
- SCAN
- C-SCAN

Disk request come into the disk drives for cylinders 65, 170, 35, 120, 10, 140 in that order.

- Discuss Banker's Algorithm.
- Consider the following snapshot of a system :

	Allocation				Max Available			
	A	B	C	D	A	B	C	D
P ₀	0	0	1	2	0	0	1	2
P ₁	1	0	0	0	1	7	5	0
P ₂	1	3	5	4	2	3	5	6
P ₃	0	6	3	2	0	6	5	2
P ₄	0	0	1	4	0	6	5	6

answer the following questions using the Banker's Algorithm :

- What is the content of the matrix need ? 1
- Is the system in a safe-state ? 4
- If a request from process P₁ arrives for (0, 4, 2, 0) can be request granted immediately. 3

Roll No. 0902323

BCA-402(N)

B. C. A. (Fourth Semester)

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(New Course)

Paper Second

OPERATING SYSTEM

Time : Three Hours] [Maximum Marks : 75

Note : Attempt questions from all Sections as directed.

Inst. : The candidates are required to answer only in serial order. If there are many parts of a question, answer them in continuation.

Section—A

(Short Answer Type Questions)

Note : All questions are compulsory. Each question carries 3 marks.

- (A) Differentiate between hard real time system and soft real time system.
- (B) Explain Belady's anomaly.
- (C) What do you understand by Synchronization Hardware ?
- (D) How jobs are scheduled in multiple processor system ?
- (E) What are four necessary conditions responsible for deadlocks ?
- (F) Discuss when a resource allocation graph contains a cycle but no deadlock.

- (G) How the logical address is converted to physical address ? Explain.
- (H) What do you understand by internal fragmentation ? How this can be resolved ?
- (I) What is a hash table ? How is it used ?

Section—B

(Long Answer Type Questions)

Note : Attempt any two questions. Each question carries 12 marks.

2. (a) Discuss Second chance page replacement algorithm. 6
- (b) For given reference string, calculate the number of page faults using optimal page replacement algorithm. Given page size = 3. 6
7 0 1 2 0 3 0 4 2 3 0 3 2 1 2 0 1 7 0 1
3. (a) What is thrashing ? Explain causes of thrashing in detail. Also suggest its solution. 8
- (b) Differentiate between segmentation and paging. 4
4. (a) Differentiate between Asymmetric multiprocessing and Symmetric multiprocessing. 4
- (b) Consider the following set of processes with the length of the CPU burst given in milliseconds : 8

Process	Burst Time	Priority
P ₁	10	3
P ₂	1	1
P ₃	2	3
P ₄	1	4
P ₅	5	2

The processes are assumed to have arrived in the order, P₁, P₂, P₃, P₄, P₅, all at time 0.

- (i) Draw four Gantt Charts that illustrate the execution of these processes using the following scheduling algorithms : FCFS, SJF, non-pre-emptive priority (taking smaller priority number implies a higher priority) and RR (quantum = 1).
- (ii) What is the turnaround time of each process for each of the scheduling algorithms in part (i) ?
- (iii) What is the waiting time of each process for each of the scheduling algorithm in part (i) ?
- (iv) Which of the Algorithm in part (i) a results in the minimum average waiting time (over all processes) ?
5. (a) What do you understand by Critical Section problem ? What requirements must be satisfied by its solution ? 6
- (b) What is the Dining-Philosophers problem ? Suggest its solution. 6

Section—C

(Long Answer Type Questions)

Note : Attempt any two questions. Each question carries 12 marks.

6. (a) The long-term scheduler controls the degree of multiprogramming. Justify by giving examples. Also discuss the need of mid-term scheduler. 6
- (b) Discuss the Disk-Space management methods. 6
- ✓ Suppose the head of moving disk is currently serving at request at track 60. If the queue of request is kept in