

Please check whether you have got the right question paper.

- N.B:
1. Q.1 is compulsory.
 2. Attempt any three from remaining five questions.
 3. Answers to sub questions should be written together.

1. A) Consider the following snapshot of the system? 10

Processes	Allocation				Maximum				Available			
	A	B	C	D	A	B	C	D	A	B	C	D
P0	0	0	1	2	0	0	1	2	1	4	2	0
P1	1	1	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	1	0	1	4	1	6	5	6				

Using Bankers algorithm answer the following

- i. What is the content of matrix need?
- ii. Is the system in safe state? Give the safe sequence.
- iii. If a request from a process P1 arrives for (0, 4, 2, 0). Can the request be granted immediately?

- B) What is an operating system? What are the main functions of operating system? 10
Discuss different types of operating system.

2. A) For the following processes given in the table: 10

Process	Arrival Time (ms)	Burst Time (ms)
P	0	10
Q	1	6
R	3	2
S	5	4

Using FCFS , SJF , SRT , RR (Quantum=4ms) Scheduling algorithm:

- i. Draw a chart illustrating process execution.
- ii. Find the average turnaround time.
- iii. Find the average waiting time.

- B) What do you mean by concurrency control? Explain different types of semaphore 10
and state the use of semaphore and monitors in concurrency control with example.

3. A) Given reference string in the following pages by a program: 10

8, 1, 2, 3, 1, 4, 1, 5, 3, 4, 1, 4, 3, 2, 3, 1, 2, 8, 1, 2

[TURN OVER]

How many page faults will occur for the following page replacement algorithms, assuming three frames?

- i. LRU replacement
 - ii. FIFO replacement
 - iii. Optimal replacement
- B) What is a domain? Discuss the access control mechanisms in the context of data files. What are capability lists? How are they used to enhance protection? 10
4. A) Suppose a disk drive has 400 cylinders, numbered 0 to 399. The driver is currently serving at cylinder 120, previous request served was at cylinder 140. Suppose the disk queue contains for I/O to blocks on the cylinder in FIFO order is: 86,147,312,91,177,48,309,222,175,130 10
- Determine total head movement in tracks for :
- i. SSTF
 - ii. SCAN
 - iii. Look
- State the best algorithm.
- B) What is fragmentation? How does it occur? Discuss the technique to overcome fragmentations. 10
5. A) Attempt the following 10
- i. Explain various process states with a suitable diagram.
 - ii. Differentiate between Monolithic kernel and Micro Kernel.
- B) What is the principle of locality? Why is it crucial to use Virtual memory? What is the purpose of Translation Look aside buffer? How to calculate number of bits in logical address and physical address when logical address space of 8 pages of 1024 word each, mapped to physical memory of 32 frames? 10
6. Write a short note on : (Any Four) 20
- i. Belady's Anomaly
 - ii. Process Control Block (PCB)
 - iii. Clock hardware and software
 - iv. Free space management
 - v. Overlays
 - vi. iOS