

(Time: 3 hours) Total marks: 80

Note:

- 1. Q1 is compulsory
- 2. Attempt any three from remaining questions
- 3. Answers to sub questions should be answered together
- 4. Illustrate answers with diagram wherever necessary

Consider the following snapshot:

(10)

(10)

Q1(a)

Processes	Allocation			Max	ζ		Available
	R1	R2	R3 R4	R1	R2	R3 R4	R1 R2 R3 R4
Po	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	

Using Banker's algorithm

- What is the context of matrix need?
- Is the system in safe state? Give the sequence.
- Consider the request from process P1 arrives for (0, 4, 2, 0).
- Can the request be immediately granted?
- (b) Describe the differences among short-term, medium-term and long-term schedulers. (10)
- Q2(a) What do you mean by concurrency control? Explain the use of semaphore and monitors in concurrency control with example. (10)
 - (b) What is an operating system? What are its services and components? (10)
- Q3(a) Given a reference string to the following pages by a program 2,1,3,3,2,8,7,8,1,2,3,1,4,1,5,6,2,6,3,5,6,7,8,7,8,3,5,3,8,4,4,3,4. How many page faults will occur for the following page replacement algorithms, assuming three frames?
 - LRU replacement
 - FIFO replacement
 - Optimal replacement
 - (b) Explain the Access Matrix model of protection. How does it serve a useful abstraction for reasoning about protection mechanism in a computer system? (10)
- Q4(a) Suppose a disk drive has 200 cylinders, numbered 0 to 199. The driver is currently serving request at cylinder 140 and previous request was a cylinder 150. The queue is pending request in FIFO order is:148, 65, 15, 58, 60, 33, 165, 175
 What is the total head movement under following scheduling algorithm?
 (i)FCFS ii) SSTF iii) SCAN iv) C-SCAN
 - (b) What is thread? Explain various kinds of threads in detail. (10)

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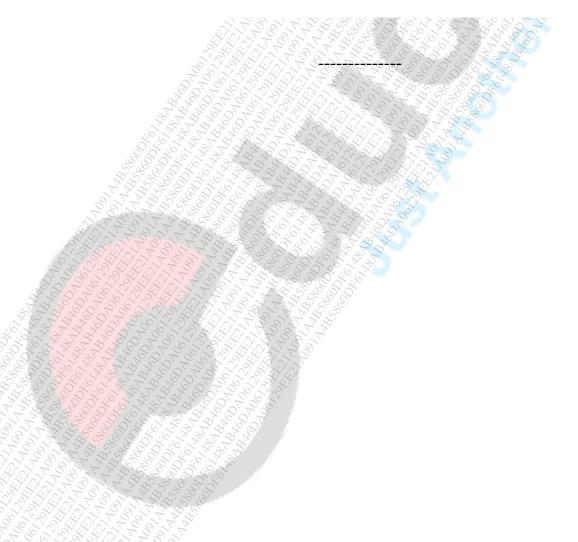
- Q5(a) For the processes listed below the table, draw Gantt chat and calculate average (10) waiting time and average turnaround time using:-
 - FCFS (first come first serve)
 - SJF (Shortest Job First) in both condition preemptive and non-preemptive
 - Round robin (Quantum = 2)

Processes	Arrival time(ms)	Burst time(ms)
P1	О	9
P2	1	5
Р3	2	7
P4	3	3

- (b) Explain the different method of file access. Explain the mechanisms of free space (10) management.
- Q6 Write short notes on: (Any four)

(20)

- Buffering and Spooling
- Process Control Block
- Clock Hardware and clock software
- Linker and Loader
- Swap-space management



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