

(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

1 a) What is Concurrency control? Explain the importance of Mutual Exclusion requirement. **10**

b) Consider following snapshot of the system: - **10**

Processes	Allocation			Max			Available		
	A	B	C	A	B	C	A	B	C
P0	0	1	0	7	5	3	3	3	2
P1	0	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			

Using Bankers algorithm answer the following:-

- i) What are the contents of need matrix?
- ii) Find if the system is in safe state? If it is, find the safe sequence.
- iii) If the request from process P1 arrives for (1,0,2), can the request be granted immediately

2 a) For the process listed in table, draw a Gantt chart and find their average waiting time and average turnaround time using **10**

- i. FCFS
- ii. Round Robin (quantum=2)
- iii. SJF (both preemptive and non-preemptive)

Process	Arrival Time	Processing Time
P1	0	2
P2	2	2
P3	3	5
P4	6	3

b) What is a scheduler? Explain the primary objective of scheduling. How many types of scheduling exists in OS. Explain with a suitable diagram. **10**

- 3 a) What is fragmentation? Explain the types of Fragmentation. How can it be tackled? **10**
- b) Suppose a disk drive has 200 cylinders, numbered 0 to 199. The disk head has just finished a request at track 99 and is currently at track 175. The queue of pending request in FIFO order is: - 22,12,133,145,76,87. Starting from the current head position, what is the total distance in cylinders that the disk arm moves to satisfy all pending request for each of the following disk scheduling algorithm?
1)SSTF 2)SCAN 3)FCFS 4)LOOK **10**
- 4 a) Given a reference string to the following pages by a program
2,3,4,1,2,4,2,4,6,7,8,2,3,6,5,4,8,9,1,8,9
How many page faults will occur for the following page replacement algorithm assuming **three** frames?
a) FIFO **10**
b) Optimal Replacement
c) LRU
- b) Explain Threads. State the difference between user level and kernel level threading. **10**
- 5 a) Define dynamic and fixed partition. What are the problems that arise with them and how can they be resolved with suitable diagram. **10**
- b) Explain Access Matrix model of Protection. Describe the various methods of implementing Access Matrix. **10**
- 6 **Write short notes on any four** **20**
- Security problems in OS
 - File Protection
 - Demand Paging
 - Deadlock condition
 - Real time OS Vs Distributed OS