QP CODE : 581101

(3 Hours) Total Marks : 80

N.B. 1. Q.no.1 is **compulsory**
2. Attempt any **three** out of the remaining five questions
3. Figures to **right** indicate **full** marks
4. Assume suitable data if necessary but justify the same

Q.1. Attempt the following (Any four)
a. Compare the monolithic and microkernals [5]
b. Explain the Internal and External Fragmentation [5]
c. What is mutual exclusion? Explain its significance [5]
d. What is a semaphore? Elaborate with example, the significance of semaphores [5]
e. Explain the effect of page size on performance of Operating System [5]

Q.2. a. Calculate hit and miss for the following string using page replacement policies – FIFO, LRU and Optimal. Compare it for the frame size 3 & 4.

1 2 3 2 1 5 2 1 6 2 5 6 3 1 3 6 1 2 4 3 [10]

b. What is a deadlock? Explain the necessary and sufficient conditions for the deadlock. Also suggest techniques to avoid deadlocks. [10]

Q.3. a. Explain an algorithm for dining philosophers problem [10]
b. Explain the banker's algorithm in detail. [10]

Q. 4. a. Explain the hardware support for paging [10]
b. Assume the following processes arrive for execution at the time indicated and the length of cpu burst time given in msec. [10]

Job	Burst time	Priority	Arrival time
P1	10	5	0
P2	6	2	0
P3	7	4	1
P4	4	1	1
P5	5	3	2

For the above process parameters, find average waiting times and average turnaround times for the following scheduling algorithms- First Come First Serve, Shortest Job First, non preemptive priority Round Robin (assume quantum=5 units)

Q.5. a. Explain the process transition diagram for UNIX operating system [10]

b. Compare the following Disk scheduling algorithms using appropriate example- SSTF, FCFS, SCAN, C-SCAN, LOOK [10]

Q.6. Write notes on the following: [20]

a. Resource Allocation Graph
b. Process Control Block
c. System Components in Windows Architecture
d. Scheduling in Linux system

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