[Time: Three Hours] **[Marks:80]**

Please check whether you have got the right question paper.

N.B:
1. Question.No.1 is compulsory.
2. Attempt any **three** questions from remaining **five** questions..
3. Make suitable assumptions wherever necessary and state them **clearly.**

Q 1 a) Define a file system. What are various components of a file system? State and explain commonly used operations on file. 5

b) What is the difference between a system call and an interrupt? 5

c) Give memory partition of 100K,500K,200K,300K and 600K(in order).How would each of the first fit, best fit and worst fit algorithm place process of 212k,417k,112k,and 426k(in order)? Which algorithm makes the most efficient use of memory? 5

d) Write four optimizing criteria for CPU scheduling. 5

Q.2 a) Consider the following page reference string A,B,C,D,B,A,E,F,A,B,C,G,F,C,F. How many page faults would occur for the following page replacement algorithm assuming three and four frames? Remember all frames are initially empty: 10

i) FIFO
ii) Optimal
iii) LRU

b) Justify the need for process synchronization & Design a solution for producer consumer problem using semaphore. 10

Q.3 a) Consider the following snapshot of the process to be executed. Draw the Gantt chart and determine the average. waiting time and average turnaround time for FCFS, SJF(non-preemptive) and round robin (quantum=2) scheduling algorithm. 10

Process	Arrival Time	Burst Time
P1	0	4
P2	2	5
P3	4	6
P4	5	2

b) Consider the following snapshot 10

Process	Allocation	Max	Available
	A B C D	A B C D	A B C D
P0	0 2 1 2	0 3 2 2	2 5 3 2
P1	1 1 0 2	2 7 5 2	
P2	2 2 5 4	2 3 7 6	
P3	0 3 1 2	1 6 4 2	
P4	2 4 1 4	3 6 5 8	

Answer the following using Banker's algorithm.
(i) What is the content of matrix Need?
(ii)Is the system in the safe state?
(iii)If the request from process PI arrives for (1,3,2,1) can request be granted immediately?

Q.4 a) Suppose the head of moving-head disk with 200 tracks, numbered 0 to 199 is currently serving a request at track 143 and has just finished a request at track 125. If the queue of requests is kept in the FIFO order 86,147,91,177,94, 150, 100, 175, 130 What is total head movement to satisfy these requests for the following disk scheduling algorithms? i) FCFS ii) SSTF iii) C-SCAN 10

b) Explain working of EDF and RMA real-time scheduling algorithms. 10

Q.5 a) What is the virtual memory? Explain with neat diagram the translation of virtual address into physical address in a segmentation/paging system. 10

b) Explain process management in Linux. 10

Q.6 a) State and explain the necessary conditions that lead to deadlock situation. 10

b) Explain how LINUX performs file management. 10

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