Duration: 3hours   **Marks: 80**

NB: (1) Question no. 1 is compulsory.
     (2) Attempt any three out of remaining five questions.
     (3) Assume data if required

Q-1   Attempt any FOUR
a   Define Operating System. Brief the Functions of OS.   5
b   Explain Shell. Explain use of chmod command in linux.   5
c   Discuss various scheduling criteria.   5
d   Explain the effect of page frame size on performance of page replacement algorithms.   5
e   Explain Thrashing.   5

2-a   Differentiate between monolithic, layered and microkernel structure of OS.   10

b   Describe the differences among short term, medium-term, and long term Scheduling   10

3-a   Discuss how the following pairs of scheduling criteria conflict in certain settings.   10
         a) CPU utilization and response time
         b) Average Turnaround time and maximum waiting time
b   Consider the following snapshot of the system. Using Bankers Algorithm, determine whether or
    not system is in safe state. If yes determine the safe sequence.

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

4-a   Calculate number of page faults and page hits for the page replacement policies FIFO, Optimal   10
    and LRU for given reference string 6, 0, 5, 2, 0, 3, 0, 4, 2, 3, 0, 3, 2, 5, 2, 0, 5, 6, 0, 5 (assuming
    three frame size).

b   Explain synchronization problem in detail. How counting semaphore can be used to solve readers   10
    writers problem.

5-a   Given memory partitions of 150k,500k,200k,300k,550k(in order) how would each of the first fit,   10
    best fit and worst fit algorithm places the processes of 220k,430k,110k,425k(in order).Evaluate,
    which algorithm makes most efficient use of memory?

b   Suppose that a disk drive has 5000 cylinders, numbered 0 to 4999. The drive is currently serving a   10
    request at cylinder 143, and the previous request was at cylinder 125. The queue of pending requests
    in FIFO is ordered as 80, 1470, 913, 1777, 948, 1022, 1750,130. What is the total distance that the
    disk arm moves for following by applying following algorithms?
    1. FCFS   2. SSTF   3. LOOK   4. SCAN

Q-6   Write short notes on: (any two):   20
         (a) Linux Virtual File system
         (b) Process State transition
         (c) System Calls

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