MCA sem II (choice Based) 18/5/2017 (72)
Operating system

Q.P. Code: 08930

[Time: Three Hours] [Marks:80]

Please check whether you have got the right question paper.

N.B:
1. Q.1 is compulsory.
2. Attempt any three from remaining five questions.
3. Answers to sub questions should be written together.

1 A) Consider the following snapshot of the system 10

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

Using Bankers algorithm
i. What is the content of Matrix Need?
ii. Is the system in safe state? Give safe sequence.
iii. If the request from P4 arrives for (0,0,2,0) can the request be granted immediately?

B) Define paging? Explain the techniques that are used for structuring the page table. 10

2 A) Suppose that a disk drive has 5,000 cylinders, numbered 0 to 4999. The drive is currently serving a request at cylinder 2,150, and the previous request was at cylinder 1805. The queue of pending requests, in FIFO order, is: 10
2069, 1212, 2296, 2800, 544, 1618, 356, 1523, 4965, 3681
Starting from the current head position, what is the total distance (in cylinders) that the disk arm moves to satisfy all the pending requests for each of the following disk-scheduling algorithms?
i. FCFS
ii. SSTF
iii. SCAN
iv. CSCAN

B) Define semaphores and monitors? Explain their significance for concurrency control. 10

3 A) What do you understand by the term real time systems? Explain any one real time scheduling algorithms. 10

[TURN OVER]

B) Consider the following page reference string: 10
1, 2, 3, 4, 2, 1, 5, 6, 2, 1, 2, 3, 7, 6, 3, 2, 1, 2, 3, 6.
How many page faults would occur for the following replacement algorithms, assuming four frames?
Remember that all frames are initially empty, so your first unique pages will cost one fault each.

i. LRU
ii. FIFO
iii. Optimal Page Replacement

4 A) Explain various file allocation techniques. 10

B) The following processes are being scheduled using a **preemptive, round robin scheduling algorithm**. Each process is assigned a numerical priority, with a higher number indicating a higher relative priority. In addition to the processes listed below, the system also has an idle task (which consumes no CPU resources and is identified as P_{idle}). This task has priority 0 and is scheduled whenever the system has no other available processes to run. The length of a time quantum is 10 units. 10

If a process is preempted by a higher-priority process, the preempted process is placed at the end of the queue.

Process	Arrival Time	Processing Time	Priority
P1	40	20	0
P2	30	25	25
P3	30	25	30
P4	35	15	60
P5	5	10	100
P6	10	10	105

i. Show the scheduling order of the processes using a Gantt chart.
ii. What is the turnaround time for each process?
iii. What is the waiting time for each process?

5 A) Define kernel of operating system. Explain different types of kernels in detail. 10

B) Define Protection? Explain the concept of access matrix with the help of an example? 10

6 Write short notes on any four - 20

i. Race condition
ii. Swap-space management
iii. Context switch
iv. Belady's Anomaly
v. Program threats
vi. Linux OS

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