

Total No. of Questions : 10]

SEAT No. :

P2622

[5153]-598

[Total No. of Pages : 3

**T.E. (Information Technology)**  
**OPERATING SYSTEM**  
**(2012 Pattern) (Semester - II) (314451)**

Time : 2½ Hours]

[Max. Marks : 70

Instructions to the candidates:

- 1) Answers Q1 or Q2, Q3 or Q4, Q5 or Q6, Q7 or Q8, Q9 or Q10.
- 2) Figures to the right indicate full marks.

- Q1) a) Discuss batch and real time operating system with respect to process scheduling, memory management. [4]
- b) Explain the concept of virtual machine with its implementation and benefits. Also explain examples of virtual machine. [6]

OR

- Q2) Consider the following set of processes with length of CPU burst time given in milliseconds.

Process	Arrival time	Burst time	Priority
P1	0	8	3
P2	1	1	1
P3	2	3	2
P4	3	2	3
P5	4	6	4

Draw the Gantt charts illustrating the execution of these processes using FCFS, SJF (Preemptive And non-pre-emptive) and Priority (Preemptive). Smaller number indicates higher priority. Calculate average waiting time and average turn around time for all the above mentioned scheduling algorithms. [10]

- Q3) Consider the following snapshot of the system, [10]

	Allocation	Max	Available
	R1R2R3	R1R2R3	R1R2R3
P1	0 1 0	7 5 3	3 3 2
P2	2 0 0	3 2 2	
P3	3 0 2	9 0 2	
P4	2 1 1	2 2 2	
P5	0 0 2	4 3 3	

P.T.O.

Answer the following questions using Banker's Algorithm

- a) What are the values of Need Matrix?
- b) Is the system in the safe mode? If yes, what is the safe sequence?
- c) If a request from process  $P_1$  arrives for (1,0,2), can the request be granted immediately?

OR

- Q4)** a) Explain with definition, concept of general and binary semaphore. [5]  
b) Explain classical problem of synchronization in terms of Dining Philosopher problem. [5]

- Q5)** a) Given memory partitions of 100k, 500k, 200k, 300k and 600k (in-order), how would each of First-Fit, Best-Fit and Worst-Fit algorithms place processes of 212k, 417k, 112k, 426k? Which algorithm makes the most efficient use of memory? [8]

- b) What are the steps in handling page fault? Explain with suitable diagram. [10]

OR

- Q6)** a) Explain the concept of Demand Paging with neat diagram. [8]  
b) A process references pages in the following order. [10]  
5 4 2 4 6 5 3 6 2 3 2 4 5 2 6

Determine the number of page faults for FIFO, optimal and LRU page replacement algorithms for 3 page frames

- Q7)** a) For the given sequence of disk request, determine the total distance travelled by disk head in satisfying the entire request for FCFS, C-SCAN and SSTF algorithms. Initial head position is 120 and total number of cylinders in the disk is 200.

120, 130, 180, 150, 25, 10, 105, 90 [12]

- b) Write a short note on I/O functions. [4]

OR

- Q8)** a) Explain the concept of File Sharing. [8]  
b) Explain disk free space management techniques. [8]

**Q9)** Write short notes on the following: [16]

- a) Ubuntu EDGE OS
- b) Embedded Linux
- c) NACH OS
- d) Android OS

OR

- Q10)** a) Write steps for kernel compilation with necessary commands. [8]  
b) Write a Pseudo code for simple kernel module and explain procedure for inserting a new module in existing kernel with all necessary steps. [8]

