Roll No .....

IT - 504

B.E. V Semester

Examination, December 2013

System Programming and Operating System

Time : Three Hours

Maximum Marks : 70

Note: Attempt any five questions. All questions carry equal marks.

Unit - I

1. a) What is macro processor? Explain machine independent macro processor features.

   b) Discuss the design of two-pass assembler.

   OR

2. a) In a multiprogramming and time-sharing environment several users share the system simultaneously. This situation can result in various security problems.

   i) What are two such problems

   ii) Can we ensure the same degree of

   Security in a time shared machine as in a dedicated machine? Explain your answer.

   b) The services and functions provided by an operating system can be divided into two main categories. Briefly describe the two categories and discuss how they differ.

Unit - II

3. a) Explain readers and writers problem. In what way this problem is different from the producer consumer problem.

   b) Discuss two synchronization mechanism for inter process communications.

OR

4. a) Explain critical section problems and its solutions.

   b) Calculate the average turn around time, average waiting time, throughput and processor utilization for the following set of processes.

Process	Processing time
P_1	20
P_2	1
P_3	10
P_4	5

Quantum is 3. Use Round Robin scheduling policy. Draw the Gantt chart also.

Unit - III

5. a) Given memory partitions of 100k, 500k, 200k 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.

   b) Explain Banker's algorithm with example.

OR

6. a) Explain the memory management in multiprogramming environment. Discuss the performance of memory management in above scheme.

   b) What are deadlock and starvation explain deadlock

Unit - IV

7. a) Discuss the hardware support required for segmented memory management scheme.

   b) How many page faults occur for an optimal page replacement algorithm for the following reference string, with four page frames?

   1, 2, 3, 4, 5, 3, 4, 1, 6, 7, 8, 7, 8, 9, 7, 8, 9, 5, 4, 5, 4, 2

OR

8. a) Explain different protection mechanism in operating systems.

   b) Explain the LRU and optimal replacement algorithms.

Unit - V

9. a) Explain how process management is done in Linux.

   b) Compare the performance of C-SCAN and SCAN scheduling assuming a uniform distribution of requests. Consider the average response time and the affective bandwidth. How does performance depend on relative time of seek time and rotational latency.

OR

10. Write short notes:

    i) File organization and access mechanism.

    ii) Directory system

    iii) Cache memory organization

    iv) Logical and physical memory address.

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