2 0 1 8

(October)

COMPUTER SCIENCE

(Honours)

(Operating System and Introduction to LINUX)

(CS-501 T)

Marks : 56

Time : 3 hours

The figures in the margin indicate full marks for the questions

Answer **one** question from each Unit

UNIT—I

1. *(a)* Write a short note on real-time operating system.   3

   (b) Explain the four transitions of the process states.   4

   (c) Five batch jobs *A* through *E* arrive at a computer centre. They have estimated running times of 8, 9, 2, 5 and 1 minutes. Use the round robin

scheduling to determine the turn-around time for each job and the mean turnaround time. Assume that only one job at a time runs, until it finishes. The time quantum is 2 minutes. 5

2. (a) What do you understand by critical region? Explain the four conditions to hold to have a good solution for race condition. 2+4=6

(b) Explain the different situations in which process scheduling is needed. 6

UNIT—II

3. (a) What do you understand by a deadlock? Explain how a deadlock can be modeled, citing an example. 2+3=5

(b) With the help of an example, explain how a deadlock is detected with one resource of each type. 3

(c) Explain deadlock recovery through rollback. 3

4. (a) What are safe state and unsafe state in deadlock avoidance? 3

(b) What are preemptable and non-preemptable resources? List the sequence of events required to use a resource. 2+1=3

(c) Explain any two ways for deadlock prevention. 5

UNIT—III

5. (a) Explain memory management using two variations of monoprogramming without swapping or paging. 5

(b) What is the function of the memory manager? 3

(c) Discuss the memory hierarchy. 3

6. (a) What do you understand by virtual memory? 2

(b) Explain the various fields that are present in a typical page table entry. 5

(c) If Least Recently Used (LRU) page replacement algorithm is used with three page frames and 10 pages, how many page faults will occur with the page string 2342137543? 4

(4)

UNIT—IV

7. (a) Explain on the four types of files supported by many operating systems. 4

(b) Explain on any four common file operations used on files. 4

(c) Write a short note on Master Boot Record (MBR). 3

8. (a) Discuss on the function of a device controller. 3

(b) Explain briefly on the operation of a DMA transfer to exchange data with the CPU. 4

(c) Disk requests come into the disk driver for cylinders 10, 22, 20, 2, 40, 6 and 38 in that order. How much seek time is needed for Shortest Seek First (SSF) algorithm? 4

UNIT—V

9. (a) What is a shell? Explain the activities that the shell performs in its interpretive cycle. 2+4=6

(b) What do you understand by escaping and quoting with regards to the shell? 3

(5)

(c) Explain the difference between the metacharacters "*" and "?" used inside a shell. 2

10. (a) Write a shell program that calculates the sum of the squares of the digits of a four-digit number. 5

(b) Write short notes on the following with an example each : 2×3=6

(i) cut.

(ii) tr.

(iii) tail.

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