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(February)

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 embedded operating systems. 3
- (b) What is booting? What are the various devices that a modern PC BIOS supports for booting an operating system? 2+2=4

- (c) Four batch jobs A through D arrive at a computer center. They have estimated running times of 8, 5, 2 and 1 minutes. Use the round-robin scheduling to determine the turnaround 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) Give the difference between non-preemptive scheduling and preemptive scheduling algorithms. How does the shortest remaining time first (SRTF) algorithm work? 3+3=6
- (b) Discuss the producer-consumer problem. How is it resolved using wakeup waiting bit? 4+2=6

UNIT—II

3. What is a deadlock? Differentiate between preemptable resources and non-preemptable resources, citing with examples of such resources. Explain the various ways to recover from a deadlock. 2+2+7=11
4. What are the methods used for deadlock prevention? Describe one of the most effective methods among them. 4+7=11

(3)

UNIT—III

5. (a) Explain the 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) Explain the importance of paging in memory management. Explain the various fields that are present in a typical page table entry. 3+4=7
- (b) If FIFO page replacement algorithm is used with three page frames and 10 pages, how many page faults will occur with the page string 2 3 4 2 1 3 7 5 4 3? 4

UNIT—IV

7. What is a device controller? Explain how DMA works. What do you understand by device-independent software? 2+6+3=11

(4)

8. (a) Suppose the order of request is (82, 170, 43, 140, 24, 16 and 190) and current position of read/write head is 50. Use FCFS disk arm scheduling algorithm to calculate the total seek time. 5
- (b) Explain byte sequence file structure. Describe the hierarchical directory system. 3+3=6

UNIT—V

9. (a) Why is UNIX considered as a multiuser and multitasking system? 6
- (b) What is a shell? What do you understand by escaping and quoting with regards to the shell? 2+3=5
10. (a) Explain six commands used in insert mode in VI Editor. 6
- (b) Write short notes on the following with an example each : $2\frac{1}{2} \times 2 = 5$
- (i) mkdir
- (ii) Differences between rm and rmdir commands

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