

Tribhuvan University
Institute of Science and Technology
2066
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Bachelor Level/ Second Year/ Third Semester/Science
Computer Science and Information Technology (CSc 203)
(Operating System)

Full Marks: 60
Pass Marks: 24
Time: 3 Hours

Candidates are required to give their answers in their own words as far as practicable.
The figures in the margin indicate full marks.

Section A

Attempt any two questions:

(2x10=20)

1. Define the term semaphore. How does semaphore help in dining philosophers problem? Explain.
2. Explain how does file allocation table (FAT) manage the files. Mention the merits and demerits of FAT system. A 200 GB disk has 1-KB block size, calculate the size of the file allocation table if each entry of the table has to be 3 bytes.

OR

Suppose that a disk drive has 100 cylinders, numbered 0 to 99. The drive is currently serving a request at cylinder 43, and previous request was at cylinder 25. The queue of pending request, in FIFO order is:

86, 70, 13, 74, 48, 9, 22, 50, 30

Starting from the current head position, what is the total distance (in cylinders) that the disk arm moves to satisfy all pending requests for each of the following disk scheduling algorithms?

- a. FCFS
 - b. SCAN
3. Write short notes on :
- a. Least recently used page replacement algorithm
 - b. Segmentation
 - c. Associative memory

Section B

Attempt any eight questions:

(8x5=40)

4. What is an operating system? Differentiate between time sharing and real time operating system.

5. Why thread is necessary? In which circumstances user-level thread is better than Kernel level thread?
6. Explain about hierarchical directory systems with diagrammatic examples.
7. How can you define the term process scheduling? Differentiate between I/O bound process and CPU bound process.
8. A system has two processes and three identical resources. Each process needs a maximum of two resources. Is deadlock possible? Explain your answer.
9. What do you mean by interrupt? Explain the working mechanism of interrupt controller.
10. Define the term indefinite postponement. How does it differ from deadlock?
11. Explain the mapping of virtual address to real address under segmentation.
12. Compare the throughput (overall performance) of SCAN with SSTF.