Tribhuvan University
Institute of Science and Technology
2071

Bachelor Level/ Second Year/ Third Semester/ Science   Full Marks: 60
Computer Science and Information Technology   Pass Marks: 24
(CSc. 203) (Operating System)   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. How thread based execution minimizes the context switching problem of process based execution? Explain the different multithreading model.
2. What is page fault? Consider the following page reference string; 3, 3, 5, 4, 7, 1, 5, 5, 1, 4, 3, 7, 6, 3, 4, 1. How many page faults would occur for each of the following page replacement algorithms assuming 4 page frames?
    a. LRU page replacement
    b. FIFO page replacement
    c. Optimal page replacement
    d. Clock replacement
3. Suppose the head of a moving- head disk with 200 tracks, numbered 0 to 199 is currently serving request at tracks 143 and has finished a request at track 125. The queue it requests is kept in the FIFO order 86, 147, 91, 177, 94, 150, 102, 175, 130. What is the total head movement needed to satisfy these request for the following disk-scheduling algorithms?
    i. FCFS   ii. SSTF   iii. SCAN   iv. LOOK

Section B
Attempt any eight questions: (8x5=40)
4. How operating is as a resource manager? Explain.
5. For each of the following transitions between the processes states, indicate whether the transition is possible. If it is possible, give an example of one thing that would cause it.
    a) Running -> Ready
    b) Running -> Blocked
    c) Blocked -> Running
6. Define file and directories. Explain about protection mechanism.
7. Differentiate between internal and external fragmentation with example.
8. What are the segmentation and paging? Why they are combined into one scheme?
9. What is DMA? Explain how it works.
10. What do you understand by deadlock detection and recovery? Discuss.
11. Explain how file allocation table (FAT) manage the files. Mention the merits and demerits of using FAT.
12. Write short notes: (Any two)
    a) Best Fit vs. Worst Fit
    b) Swapping
    c) Semaphores