Tribhuwan University
Institute of Science and Technology
2076

Bachelor Level / fourth-semester / Science Full marks: 60 **Computer Science and Information Technology(CSC259)** Pass marks: 24 (Operating Systems) 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. Defined interactive system goals? List various interactive scheduling algorithms. Consider following process data and compute average waiting time and average turnaround time for RR(quantum 10) and priority scheduling algorithms.

PID Burst Time Arrival Time Priority A 16 0 1 B 37 12 2 C 25 7 3

2. How does the Second Chance page replacement algorithm differ from FIFO page replacement policy? Discuss the concept of Belady's anomaly with suitable examples.

3. What is the main objective of disk scheduling algorithms? Why is SSTF not practically feasible? Assume that we have a disk with 100 tracks and currently the head is at track number 35. What will be the seek time for the algorithms SCAN and LOOK for processing IO requests queue: 52, 67, 27, 11, 43, 85, 18, 75, 92, 8?

Section-B

Attempt any eight questions: (8x5=20)

4. What are two modes of OS? Discuss different OS structures briefly.

5. When are threads better than processes? Explain the concept of user level threads in detail.

6. Differentiate between multi programming and Monoprogramming. What will be the CPU utilization with 6 processes with 60% IO waiting time in memory?

7. How can you manage free disk space? Explain the linked list approach of managing free disk space with examples.

8. When programmed IO is more suitable than other IO handling techniques? Explain the process of IO handling using

DMA.

9. Differentiate between deadlock and starvation? Discuss the process of detecting deadlocks when there are multiple resources of each type.

10. What is the problem associated with semaphores? Explain the concept of monitors in brief.

11. Why is program relocation and protection important? Explain the technique of achieving program relocation and protection.

12. Write short notes on:

- **Linux File System**
- **Resource Allocation Graph**