Tribhuvan University
Institute of Science and Technology
2082
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Bachelor Level / Second Year/ Fourth Semester/ Science — Full Marks: 60
Computer Science and Information Technology (CSC 259) — Pass Marks: 24
(Operating Systems) — Time: 3 hours.
(OLD COURSE)

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

Section A

Long Answer Questions.
Attempt any TWO questions. **[2×10=20]**

1. What is multiprogramming? Distinguish between thread and process. Describe the transition between different states of a process. [2 + 3 + 5]

2. How do operating system handle I/O? Consider a disk queue with requests for I/O to blocks on cylinders 98, 183, 41, 122, 14, 124, 65, 67. The head is initially at cylinder number 53 and the cylinders are numbered from 0 to 199. Calculate the total head movement for servicing the request using FCFS, SSTF and CSCAN. [2.5 + 7.5]

3. Why do we need TLB? Explain the structure of a page table. [4 + 6]

Section B

Short Answer Questions
Attempt any EIGHT questions. **[8×5=40]**

4. Define the shell. Discuss about the system call. [2 + 3]

5. Explain the single level and two level directory system. [5]

6. Describe the different types of operating system. [5]

7. How Banker's algorithm can be used to avoid deadlock? Explain. [5]

8. Consider the five processes A, B, C, D and E with their corresponding CPU burst time 5, 10, 3, 6 and 8 in seconds respectively, processed on a single CPU system. All processes are at time 0 in state ready. Draw a Gantt chart and calculate average waiting time of the processes using Round Robin (quantum = 2). [5]

9. Explain the deadlock detection mechanism for single instance resources. [5]

10. Explain the concept of I nodes. [5]

11. Explain about kernel models and file system management approaches in Linux. [5]

12. Define mutual exclusion. Differentiate between paging and segmentation. [2 + 3]