CSC 259-2078 ✡

Tribhuvan University
Institute of Science and Technology
2078
✡

Bachelor Level / Second Year/ Forth Semester/ Science
Computer Science and Information Technology (CSC 259)
(Operating Systems)

Full Marks: 60
Pass Marks: 24
Time: 3 hours.

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

Attempt all the questions.

Section A

Long Answer Questions
Attempt any Two questions (2x 10=20)

1. What kind of problem arises with sleep and wakeup mechanism of achieving mutual exclusion? Explain with suitable code snippet.

2. Why OPR is best but not pratically feasible page replacement algorithm? Calculate the number of page faults for OPR, LRU, and Clock page replacement algorithm for the reference string: 1, 3, 4, 2, 3, 5, 4, 3, 1, 2, 4, 6, 3, 2, 1, 4, 2. Assume that memory size is 3.

10

3 How unsafe state differs from deadlocked state? Consider following initial state and identify wheather requested resource is and granted or denies for the given cases.

Process	Has	Max
A	2	6
B	1	5
C	2	3
D	3	8

Free=2

- What will happen if process D request 1 resource?
- What will happen if process A request 1 resource?

Section B

Short Answer Questions
Attempt any Eight questions. (8x5=40)

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4. What is system call? Discuss process of handling system calls briefly.

5. What is lock variable? Discuss its working and problems associated with it in detail.

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6. Differentiate between internal and external fragmentation? Suppose that we have memory of 1000 KB with 5 partitions of size 150 KB, 200 KB, 250 KB, 100 KB, and 300 KB. Where the processes A and B of size 175 KB and 125 KB will be loaded, if we used Best-Fit, and Worst-Fit Strategy?

7. What is meant by file attributes? Discuss any one technique of implementing directories in detail.

8. Why the concept of disk interleaving is important? Explain with suitable example.

9. What is resource allocation graph? Explain the process of detecting deadlocks when there is single instance of each resource with suitable example?

10. Discuss the concept of SJF and SRTN scheduling algorithms with suitable example.

11. What approaches are used for managing free disk spaces? Explain linked list approach with example.

12. Write short notes on:
    - IPC in Linux
    - Disk access