

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

Long Answer Questions.

Attempt any Two questions (2 x 10 = 20)

1. What kind of problem arises with sleep and wake up mechanism of achieving mutual exclusion? Explain with suitable code snippets.
2. Why is OPR the best but not practically 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.
3. How does an unsafe state differ from a deadlock state? Consider the following initial state and identify whether requested resource is and granted or denied 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 I process THE request 1 resource?
- what will happen if a process requests 1 resource?

Section B

Short Answer Questions.

Attempt any Eight questions. (8 x 5 = 40)

4. What is a system call? Discuss the process of handling system calls briefly.
5. What is the lock variable? Discuss its working and problems associated with it in detail.
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 is the concept of disk interleaving important? Explain with suitable examples.
9. What is a resource allocation graph? Explain the process of detecting deadlocks when there is a single instance of each resource with a suitable example?
10. Discuss the concept of SJF and SRTN scheduling algorithms with suitable examples.
11. What approaches are used for managing free disk spaces? Explain a linked list approach with suitable examples.
12. Write short notes on:

- IPC in Linux
- Disk access