



Tribhuvan University
Faculty of Humanities & Social Sciences
OFFICE OF THE DEAN
2023

Bachelor in Computer Applications
Course Title: Operating System
Code No: CACS251
Semester: IV

Full Marks: 60
Pass Marks: 24
Time: 3 hours
Batch: 2020

Candidates are required to answer the questions in their own words as far as possible.

Group B

Attempt any SIX questions.

[6×5 = 30]

2. Define Operating System? Explain objectives of Operating System. [1+4]
3. How can we solve producer-consumer problem semaphore? [5]
4. What do you mean by Preemptable and Non-Preemptable resources? Describe the necessary conditions for deadlock. [2+3]
5. Given memory partitions of 200k, 600k, 300k, 400k and 700k (in order), how would each of the First-fit, Best-fit and Worst-fit algorithms place processes of 315k, 527k, 202k and 548k (in order)? Which algorithm makes the most efficient use of memory? [5]
6. What is meant by system threat? Explain different types of program threat. [1+4]
7. Explain methods of communication in a distributed system. [5]
8. Write short notes on (Any Two): [2.5+2.5]
 - a) Access Control Matrix
 - b) Process States
 - c) Kernel

Group C

Attempt any TWO questions.

[2×10 = 20]

9. The processes are assumed to have arrived in the order p1, p2, p3, p4, p5 all at time 0. Draw Gantt chart illustrating their execution and calculate average waiting time and turnaround time for the process given below using: [10]
 - a) First Come First Serve
 - b) Shortest Remaining Time Next
 - c) Priority
 - d) Round Robin (quantum = 2)

| Process | Burst Time (Sec) | Priority |
|----------------|------------------|----------|
| P ₁ | 2 | 2 |
| P ₂ | 1 | 1 |
| P ₃ | 8 | 4 |
| P ₄ | 4 | 2 |
| P ₅ | 5 | 3 |

10. What is Disk Access Time and Disk Response Time? Suppose that a disk has 200 cylinders, numbered (0-199). The drive is currently serving a request at cylinder 43 and previous request was at cylinder 25. The queue of pending request, in FIFO order is: 55, 58, 39, 18, 90, 160, 150, 38, 184. Starting from the current head position, what is total distance (in cylinders) that the disk arm moves to satisfy all pending request for each of following disk scheduling algorithms? [2+8]
 - a) FCFS
 - b) SSTF
 - c) C-SCAN
 - d) LOOK
11. Differentiate between internal and external fragmentation? Explain briefly with examples and procedure to remove the types of fragmentation. [4+6]