

2053
B.E. (Computer Science and Engineering)
Fourth Semester
CS-403: Operating System

Time allowed: 3 Hours

Max. Marks: 50

NOTE: Attempt five questions in all, including Question No. 1 which is compulsory and selecting two questions from each Unit.

x-x-x

I. Attempt the following:-

- a) Differentiate counting and binary semaphore.
- b) Explain the key aspects of inter process communication.
- c) Discuss the access matrix mechanism related to protection.
- d) Write a note on Dining-philosophers problem.
- e) State the conditions to satisfy critical section problem. (5x2)

UNIT - I

II. Consider the processes with burst time

Process	burst Time	Priority
P1	7	3
P2	9	2
P3	2	1
P4	1	4
P5	3	5

The processes are assumed to arrive in order P1, P2, P3, P4, P5. Draw Gantt-chart showing execution of these processes using FCFS, SJF, preemptive priority, and RR (time quantum = 1) scheduling algorithms. (10)

III. a) Explain in detail the methods for deadlock detection? Also clearly explain the possible solutions of deadlock recovery. (5)

b) Explain the following:-

- i) protection mechanisms
- ii) thrashing and virtual memory (2x2.5)

P.T.O.

(2)

- IV. a) Explain various services offered by OS, and various system calls.
b) Explain shared segments and file architecture. (2x5)

UNIT - II

- V. a) Consider page references 7,0,1,2,0,3,0,4,2,3,0,3,2,3 with four page frames. Find the number of page faults with optimal page replacement algorithm.
b) How demand paging affects the performance of a computer system? Justify. (6,4)
- VI. a) Explain SCAN and C-SCAN scheduling by giving an example.
b) Explain in detail the layered structure of operating system. (2x5)
- VII. Write note on the following:-
a) Kernel in LINUX operating system
b) Buffering and caching
c) Race condition
d) Linked and contiguous file allocation (4x2½)

x-x-x