

BACHELOR OF TECHNOLOGY (CBCS - 2023)
B. Tech. Sem-IV Computer Science & Business Systems : WINTER: 2025
SUBJECT: OPERATING SYSTEM

Day : Tuesday
Date : 25/11/2025

W-29285-2025

Time : 10:00 AM-01:00 PM
Max. Marks : 60

NB :

1. Assume suitable data, if necessary.
2. Draw neat labelled diagrams WHEREVER necessary.
3. Figures to the right indicate FULL marks for the question.
4. All questions are COMPULSORY.

Q. 1 Define operating system. Describe in brief the evolution of Operating System. (10)

OR

Q. 1 What is virtual machine? Explain the concept of virtualization in detail. (10)

Q. 2 Draw process state transition diagram and explain each state in it. (10)

OR

Q. 2 Explain User level and Kernel level threads. Explain concept of multithreading. (10)

Q. 3 Explain Real Time scheduling and Multiprocessor scheduling. (10)

OR

Q. 3 For the table given below calculate the average waiting time and average turn around time and draw a Gantt Chart illustrating the process execution using following scheduling algorithms. (10)

- i) RR (Time slice -2 units) ii) SJF (non-preemptive)

Process	Arrival Time	Burst time
P1	0	10
P2	1	06
P3	2	12
P4	3	15

Q. 4 Write a semaphore solution for Dining Philosopher problem in operating system. (10)

OR

Q. 4 What is deadlock? Write a note on deadlock detection and recovery. (10)

Q. 5 Describe Internal fragmentation, External fragmentation, Compaction and Locality of Reference. (10)

OR

Q. 5 Consider the page reference string 1, 2, 3, 4, 2, 3, 4, 5, 6, 7, 3, 2, 4. Calculate page fault and hit ratio for FIFO, LRU and optimal (frame size = 3). (10)

Q. 6 Explain free space management techniques in detail. (10)

OR

Q. 6 List and explain different file allocation mechanisms. (10)

* * * * *

251125-m-coe-mumbai