

BACHELOR OF TECHNOLOGY (CBCS) (2021-COURSE)
B. Tech. Sem - IV Computer Science & Engineering : WINTER : 2024
SUBJECT: SYSTEM PROGRAMMING & OPERATING SYSTEM

Day : Saturday
 Date : 07/12/2024

W-25582-2024

Time : 02:30 PM-05:30 PM
 Max. Marks : 60

N.B.

- 1) All questions are **COMPULSORY**.
- 2) Figures to the **RIGHT** indicate **FULL** marks.
- 3) Assume suitable data **WHEREVER** necessary.
- 4) Draw neat labeled diagrams **WHEREVER** necessary.

Q.1 Elaborate on the fields of Symbol Table (ST) and Literal table (LT) and provide a suitable example for each. Explain in brief imperative statements, declarative statement and assembler directives. (10)

OR

Q.1 What is forward reference and how does a single-pass assembler handle them? Additionally, provide a comprehensive explanation of the component of system software? (10)

Q.2 List and explain phases of compilation with suitable example. (10)

OR

Q.2. Explain different functions of loader. Write in detail Compile and Go Loader scheme with advantages and disadvantages. (10)

Q.3 Explain various process states with suitable process state diagram. What is system call in OS also explain various system calls in OS. (10)

OR

Q.3 Draw Gantt chart and calculate average Turnaround time. Average waiting time for the following processes using FCFS algorithm. (10)

Process	Arrival Time	Burst Time
P1	4	5
P2	6	4
P3	0	3
P4	6	2
P5	5	4

Q.4 Explain in detail Readers-Writers Problem and Dining Philosopher Problem. (10)

OR

Q.4 Define Deadlock. Find the safe sequence for execution of following processes using Banker's Algorithm. Maximum Resources are A=10, B=5, C=7 (10)

Process	Allocation Matrix			Maximum Requirement / Need Matrix		
	A	B	C	A	B	C
P1	0	1	0	7	5	3
P2	2	0	0	3	2	2
P3	3	0	2	9	0	2
P4	2	1	1	4	2	2
P5	0	0	2	5	3	3

Q.5 What is Virtual Memory? Explain demand paging with example. Explain segmentation using suitable example. (10)

OR

Q.5. Consider the page reference string 2,3,2,1,5,2,4,5,3,2,5,2. Discuss working of FIFO, LRU and Optimal page replacement policies. Also count page faults using these policies. (Frame Size=3) (10)

Q.6 Write a note on: (10)

- i). Disk Scheduling
- ii) Directory Structure

OR

Q.6 What is I/O Buffering? Explain its types in detail. (10)