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

Day : Tuesday
Date : 25/11/2025

W-29274-2025

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 Explain the need of system programming. What is forward reference problem? Explain how it is handled by assembler with suitable example. (10)

OR

Q. 1 Explain in brief imperative statement, declarative statement and assembler directives with example for assembly language programming (10)

Q. 2 Define system call. Explain in detail steps in making system call. (10)

OR

Q. 2 Explain multiprogramming. How it works? Elaborate multitasking/time sharing OS with its benefits and challenges. (10)

Q. 3 Illustrate preemptive and non-preemptive scheduling. Consider the set of 5 processes whose arrival time and burst time are given. Calculate the average waiting time and average turnaround time, if FCFS scheduling Algorithm is followed. (10)

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

OR

Q. 3 Define the concept of process. Describe the process control block with neat diagram. Elaborate process states along with diagram. (10)

Q. 4 Explain in detail Readers-Writer classic synchronization problem in operating system. (10)

OR

Q. 4 Explain in detail producer consumer classic synchronization problem in operating system. (10)

Q. 5 Illustrate first fit, best fit and worst fit memory allocation strategies with suitable example. (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 Elaborate methods of file organization. (10)

OR

Q. 6 Describe file directory structure with suitable diagram. (10)

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