



SCHOOL OF COMPUTER SCIENCE ENGINEERING AND INFORMATION SYSTEMS
CONTINUOUS ASSESSMENT TEST - I
FALL SEMESTER 2025-2026

SLOT: E1+TE1

Programme Name & Branch : B. Tech. IT
Course Code and Course Name : BITE303L *Operating Systems*
Faculty Name(s) : Dr. Harshita Patel, Dr. Meenatchi S, Dr. Vivekananda GN
Class Number(s) : 3239, 3233, 3226
Date of Examination : 21-Aug-2025
Exam Duration : 90 minutes
Maximum Marks: 50

General instruction(s):

- Answer All Questions
- M - Max mark; CO - Course Outcome; BL - Blooms Taxonomy Level (1 - Remember, 2 - Understand, 3 - Apply, 4 - Analyse, 5 - Evaluate, 6 - Create)
- Course Outcomes (Type the CO statements covered in this question paper. Use the CO number as per the syllabus copy)
 1. Knowledge on Operating systems and its different subsystems in controlling computer hardware.
 2. Apply principles of process management, CPU scheduling and deadlocks.

Q. No	Question	M	CO	BL
1.	You have been assigned the task to evaluate different operating system structures (such as simple, layered, modular etc.). Analyze the advantages and disadvantages of each structure and recommend the most suitable structure for a modern multitasking OS designed for cloud environments. Justify your recommendation based on OS design principles and operational needs.	10	1	4
2.	Explain what a system call is and describe what happens when a system call is made, including how the kernel code for the specific system call is invoked with the correct parameters passed and any other relevant details.	10	1	2
3.	Compare the strengths and limitations of shared-memory and message-passing interprocess communication mechanisms in terms of performance, complexity, and scalability. Suggest the most appropriate IPC mechanism for a distributed multiplayer gaming platform and justify your recommendation.	10	2	4
4.	Compare many-to-one, one-to-one, and many-to-many multithreading models in terms of performance and scalability in multicore systems. Briefly explain user-level vs kernel-level threads.	10	2	2



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5. Consider the following set of processes, with the length of the CPU burst given in milliseconds:

Process	Burst Time	Priority
P ₁	5	4
P ₂	3	1
P ₃	1	2
P ₄	7	2
P ₅	4	3

The processes are assumed to have arrived in the order P₁, P₂, P₃, P₄, P₅, all at time 0.

- Draw four Gantt charts that illustrate the execution of these processes using the following scheduling algorithms: FCFS, SJF, non-preemptive priority (a larger priority number implies a higher priority), and RR (quantum = 2).
- What is the turnaround time of each process for each of the scheduling algorithms in part a?
- What is the waiting time of each process for each of these scheduling algorithms?
- Which of the algorithms results in the minimum average waiting time (over all processes)?

10 2 3
