



VIT

Vellore Institute of Technology
(Deemed to be University under section 3 of UGC Act, 1956)

REG.NO.:

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

SLOT: E2+TE2

Programme Name & Branch : B. Tech. IT Operating Systems
Course Code and Course Name : BITE303L
Faculty Name(s) : Dr. Harshita Patel, Dr. Meenatchi S, Dr. Vivekananda GN
Class Number(s) : 3240, 3236, 3229
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

2. Apply principles of process management, of OS		M	CO	BL																												
Q. No	Question																															
1.	An application developer is designing a new multimedia editing software. Identify the operating system services the application would rely on during development and execution and explain how each service would support the software's functionality.	10	1	4																												
2.	Explain the trade-offs between different user-operating system interface designs in terms of usability, system performance, and resource consumption. Recommend the most appropriate interface approach for an operating system intended for resource-constrained embedded devices and justify your choice with specific design principles.	10	1	2																												
3.	Analyze what a thread is in an operating system. Discuss the benefits of using threads over processes. Differentiate between concurrency and parallelism in multithreaded programming. Also, describe any two common threading issues that can arise during execution.	10	2	4																												
4.	Explain the concept of a process in an operating system, including its states and the role of the Process Control Block (PCB).	10	2	2																												
5.	The following processes are being scheduled using a preemptive, priority-based, round-robin scheduling algorithm.	10	2	3																												
<table><tr><th>Process</th><th>Priority</th><th>Burst</th><th>Arrival</th></tr><tr><td>P₁</td><td>8</td><td>15</td><td>0</td></tr><tr><td>P₂</td><td>3</td><td>20</td><td>0</td></tr><tr><td>P₃</td><td>4</td><td>20</td><td>20</td></tr><tr><td>P₄</td><td>4</td><td>20</td><td>25</td></tr><tr><td>P₅</td><td>5</td><td>5</td><td>45</td></tr><tr><td>P₆</td><td>5</td><td>15</td><td>55</td></tr></table>					Process	Priority	Burst	Arrival	P ₁	8	15	0	P ₂	3	20	0	P ₃	4	20	20	P ₄	4	20	25	P ₅	5	5	45	P ₆	5	15	55
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Each process is assigned a numerical priority, with a higher number indicating a higher relative priority. The scheduler will execute the highest-priority process. For processes with the same priority, a round-robin scheduler will be used with a time quantum of 10 units. If a process is preempted by a higher-priority process, the preempted process is placed at the end of the queue.

- Show the scheduling order of the processes using a Gantt chart.
- What is the turnaround time for each process?
- What is the waiting time for each process?

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