REG.NO.:

VIT
Vellore Institute of Technology

# School of Computer Science and Engineering

**CONTINUOUS ASSESSMENT TEST - II**
**FALL SEMESTER 2024-2025**

SLOT:A1

**Programme Name & Branch** :B.Tech -CSE
**Course Code and Course Name** : BCSE305L-Embedded Systems
**Faculty Name(s)** : Dr.Bhulakshmi B **Class Number(s):** VL2024250108125
**Date of Examination** :13-10-2024
**Exam Duration** : 90 minutes **Maximum Marks: 50**

**Answer ALL the questions**

| Q. No | Question | M |
|---|---|---|
| 1. | How do the design requirements and constraints differ between hard and soft real time systems? **Provide** an example for both type of systems. | 10 |
| 2. | **Evaluate** how the following parameters affect the schedulability of real time tasks:-<br>• Arrival Time<br>• Current Time / Scheduling point<br>• Execution Time<br>• Rate or Period<br>• Deadline<br>Suggest an **optimal scheduling** scheme using any three parameters mentioned above and apply it for the following dataset:- | 10 |

| Task | Arrival Time | Execution Time | Period | Deadline |
|---|---|---|---|---|
| T1 | 0 | 4 | 20 | 8 |
| T2 | 0 | 3 | 5 | 5 |
| T3 | 0 | 3 | 10 | 9 |

**Note:** Consider current time as per the scheduling points. Illustrate the task time-line graph for two cycles.

| 3. | Find out the needs for software optimisation techniques and analyse various Software optimisation techniques in details with respect to embedded system software design using suitable examples. | 10 |
|---|---|---|
| 4. | **Compute** the CPU utilization and check whether the given tasks are schedulable in RTOS. Apply **RMS** and **EDF** algorithms on the given data. **Illustrate** the task time-line graph for two cycles. | 10 |

| Task | Start time | Execution Time | Deadline | Period |
|---|---|---|---|---|
| T1 | 0 | 10 | 30 | 30 |
| T2 | 4 | 3 | 10 | 10 |
| T3 | 5 | 10 | 25 | 25 |

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|---|---|---|
| 5. | Construct **FSM model And CDFG** for the given real time embedded system **"Industrial Temperature Control System"** used in industrial environments to maintain temperature within safe operational limits and avoid equipment damage, product spoilage, or safety hazards.<br><br>**Requirements:**<br>• The system must accurately measure temperature.<br>• Temperature readings must be updated and displayed in real-time.<br>• Threshold Alarms- an audible and/or visual alarm must be triggered when the temperature exceeds these thresholds.<br>• Relevant states, events and actions to be considered. | 10 |

****ALL THE BEST****