

Reg. No.:

Name :



**VIT**

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

**Continuous Assessment Test II-March 2024**

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|-----------|--|------------|---|
| Programme | : B.Tech   | Semester   | : Winter 23-24  |
| Course    | : Design of Smart Cities                                   | Code       | : BCSE316L  |
|           |  | Class Nbr  | : CH2023240501901<br>CH2023240501904<br>CH2023240501908 |
|           |  |            |   |
| Faculty   | : Dr. Gayathri.R, Dr. Ilavendhan, Dr. Sahaya Beni Prathiba | Slot       | : E1+TE1  |
| Time      | : 1 1/2 Hours  | Max. Marks | : 50  |

**Answer all the Questions**

- Under "living green" theme, Brook city has decided to calculate the carbon footprint produced by each citizens and categorize the outcomes "low", "average" or "high". Carbon footprint due to the routine activities of individuals need to be added up for calculating the total emissions/citizen. Hence they decided to group the citizens under the below cases:
  - Luxury Citizen: 4 cars, 4 times flight travel/year, not recycling newspaper or used tins, paying electricity charges 10 Lakhs/month. 15
  - Average Citizen: 1 car, 1-time flight travel/year, not recycling newspaper or used tins, paying electricity charges 10k/month.
  - Normal Citizen: No cars, no flight travel, not recycling newspaper, recycling tins, paying electricity charges 500 rupees/month.

For each given case, calculate carbon footprint, categorize the outcomes and depict the impact of social cohesion in the aforementioned theme.
- For the "living green" theme depicted in Question 1, is it possible to achieve sustainable outcomes by enforcing common regulations to the citizens in the level of carbon footprints produced by them? If so, what kind of awareness or statistics need to be provided to make them reduce the same? 5
- You are a cybersecurity specialist for a smart city's public transportation system. Recently, a sophisticated cyberattack targeted the IoT devices deployed in the city's subway system. The attack exploited vulnerabilities in the transit network's control systems, allowing unauthorized access to critical infrastructure components such as train control systems, signaling equipment, and passenger information displays. As a result of the breach, the attackers gained control over train operations, disrupted service schedules, and displayed false information to passengers, leading to confusion, delays, and potential safety risks. 20
  - As a cybersecurity specialist tasked with mitigating the security breach in the smart city's subway system, outline a detailed plan to address the situation. (5 marks)
  - Consider measures such as identifying the attack vectors, patching vulnerabilities, isolating compromised devices, and enhancing network

security protocols. (5 marks)

- c. Explain how each measure contributes to ensure passenger safety, restoring service reliability, and preventing future attacks on the transit network. (5 marks)
- d. Discuss potential challenges and considerations in implementing these measures and propose strategies for overcoming them effectively. (5 marks)

4. Formulate steps to develop a smart city system design of an intelligent transportation system for monitoring possible flaws, automatic addressing of network failures, predicting carbon emissions/year based on daily metered usage of electricity and detecting security violations in regular basis. The algorithm developed for aforementioned purpose need to address design requirements sequentially. Depict the complete algorithm steps along with a neat data flow diagram. Assess the performance of intelligent transportation system by choosing appropriate performance indicators. 10

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