Reg. No.:

Name    :

# VIT

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

## Continuous Assessment Test I-February 2024

| Programme | : B.Tech | Semester | : Winter 23-24 |
|---|---|---|---|
| Course | : Design of Smart Cities | Code | : BCSE316L |
| | | Class Nbr | : CH2023240501901, CH2023240501904, CH2023240501908 |
| Faculty | : Dr. Gayathri.R, Dr. Ilavendhan, Dr. Sahaya Beni Prathiba | Slot | : E1+TE1 |
| Time | : 1₁/₂ Hours | Max. Marks | : 50 |

### Answer all the Questions

1. Assuming the role of chief technology officer in implementing an urban network specific to roads for a smart city, the task given is to carry out seamless integration of traffic management and transport systems.

    i) Deliberate key considerations and challenges in carrying out the integrated solution by listing out the requirements in detail. **(5 Marks)**

    ii) Propose 4 automated procedures or mechanisms that could be programmed in the aforementioned smart systems to avoid the current difficulties related to traffic congestion, manual tickets, unreliable timing, and overcrowding with neat architecture. **(7 Marks)**

    iii) Outline the role of sensors that could be adopted in the above smart city implementation procedure and its importance in achieving an efficient outcome. **(3 Marks)**

    **15**

2. Imagine you are a city planner tasked with transforming a medium-sized city into a smart city. The city is grappling with issues such as violent activities, overpopulation, and increased energy consumption.

    i) As step one, depict any 7 urban planning principles that need to be given immediate attention to begin the planning process. Elaborate on each urban planning principle by mapping its relevancy in addressing the aforementioned issues. **(9 Marks)**

    ii) To implement an automated procedure, how the real-time feedback from the urban population be collected through remote sensing techniques? Depict the procedure with neat architecture. **(6 Marks)**

    **15**

3. Assume that you are part of the urban planning team responsible for deploying a sensor network to monitor air quality in a rapidly growing smart city. The city is experiencing increased pollution levels due to industrial activities, vehicular emissions, and urban development. Your task is to design an effective sensor network that can accurately measure air pollutants, provide real-time data to city authorities and residents, and suggest relevant policy decisions for improving air quality.

    i) Considering the complexity of the urban environment and limited resources, how would you approach the design and deployment of the sensor network? **(4 Marks)**

    **10**

ii) What factors would you consider in selecting sensor locations, determining data transmission methods, and ensuring data accuracy and reliability? **(3 Marks)**

iii) How the urban planning database information would help in the above scenario for the effective deployment of sensor networks? Illustrate their applicability in detail. **(3 Marks)**

4. Imagine you are tasked with implementing energy efficiency measures in a smart city's public buildings, including schools, libraries, and administrative offices. You can access real-time energy consumption data and funding to invest in retrofitting initiatives. However, it would help if you prioritized which buildings to target first based on various factors such as energy usage patterns, building age, and potential cost savings.

10

i) How would you approach this decision-making process, and what criteria would you use to determine the order of retrofitting projects? **(5 Marks)**

ii) Discuss the city's sustainability goals and the need to maximize the impact of your initiatives. **(5 Marks)**

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