*Total number of printed pages:* **02**

**UG/6th/UCSE612**

**2023**

# Internet of Things

*Full Marks : 100*

Time : Three hours

***The figures in the margin indicate full marks for the questions.***

*Answer* ***any five*** *questions.*



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| 1. | a) | Explain the role of TCP and UDP in IoT communication. | 10 |
| | b) | What are the considerations for selecting the appropriate communication protocol for an IoT application? Explain with an example. | 10 |
| 2. | a) | Compare Wi-Fi, Zigbee, LoRaWAN, 4G, 5G, Bluetooth, Z-Wave, and NB-IoT in terms of data rate, coverage, interoperability, scalability, device compatibility, security, and use cases for IoT communication. | 15 |
| | a) | What are the common types of sensors and actuators used in IoT for smart home applications? | 5 |
| 3. | a) | How can IoT technologies contribute to the development of a smart city and what are the potential benefits and challenges associated with implementing IoT in urban environments? | 15 |
| | b) | How does connectivity enhance the functionality of vehicles in the context of road safety? Explain with an example. | 5 |
| 4. | a) | Discuss various architectural views of IoT such as Functional, Information, Operational and Deployment with an example. | 15 |
| | b) | What are the major constraints and challenges that designers face when designing IoT systems. | 5 |
| 5. | a) | How does the integration of IoT with cloud computing, fog computing, and edge computing contribute to the scalability, efficiency, and real-time decision-making capabilities of IoT systems? Explain with examples. | 10 |
| | b) | Design an IoT-based solution for monitoring healthcare parameters of elderly individuals, taking into consideration their specific needs and challenges. Draw the system architecture and explain working principles. | 10 |

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| 6. | | What are the steps and considerations involved in setting up a smart home application using the integration of sensors, actuators, Arduino, and Raspberry Pi, and how can these components work together to automate and enhance various aspects of a home? Explain with an example. | 20 |
| 7. | a) | How does Software-Defined Networking (SDN) differ from traditional networking approaches, and what are the key advantages of implementing SDN in terms of network flexibility, programmability, and centralized control? | 10 |
| | b) | How would you propose utilizing IoT technology to monitor and optimize crucial factors such as soil moisture, temperature, humidity, and sunlight, while also providing automated irrigation, pest detection, and crop growth analysis to improve overall agricultural productivity and sustainability? | 10 |