

{This Question paper Contain 2 printed pages}

Unique Paper Code: 2513012004
Name of the Course: B.Sc. (H) Electronics (GE)
Name of the Paper: Internet of Things
Semester: VII
Duration: 03 Hour
Maximum Marks: 90

Instruction for Candidates

1. Write your Roll No. on the top immediately on receipt of this question paper.
2. Question 1 is compulsory. All questions will carry equal marks.
3. Question paper should have 7 questions out of which 5 questions will have to be attempted.

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| Q1 | (a) | Why is IPv6 considered critical for the large-scale deployment of IoT? | 3 |
| | (b) | Differentiate between M2M and IoT technologies. | 3 |
| | (c) | What is the difference between a sensor and an actuator? | 3 |
| | (d) | What is an Arduino Shield? Give one example of a commonly used shield. | 3 |
| | (e) | Write the correct C syntax for an Arduino program to configure pin 13 as an OUTPUT and pin 7 as an INPUT. | 3 |
| | (f) | List the four primary cloud deployment models. | 3 |
| Q2 | (a) | With the help of the diagram, Explain the architecture of level 5 system. | 6 |
| | (b) | Describe the Physical design of IoT in detail. | 6 |
| | (c) | Explain about Software Define Networking (SDN). | 6 |
| Q3 | (a) | Compare MQTT and CoAP protocols in terms of architecture, reliability, and use cases. | 6 |
| | (b) | "Bluetooth is suitable for Personal Area Networks (PANs) in IoT." Justify this statement by explaining the characteristics of Bluetooth that make it fit for short-range, device-to-device communication. | 6 |
| | (c) | Explain the concept and classification of sensors with suitable examples (Position, Velocity, Force). | 6 |

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| Q4 | (a) | Explain the basic structure of an Arduino program (sketch). Describe the role of the <code>`setup()`</code> function and the <code>`loop()`</code> function with suitable code examples for each. | 6 |
| | (b) | Explain the role of UART and serial libraries in Arduino/Raspberry Pi communication. How is data exchanged with the serial monitor? | 6 |
| | (c) | How are digital and analog pins accessed in an Arduino sketch? | 6 |
| Q5 | (a) | Explain the three core Cloud Service Models (IaaS, PaaS, SaaS) using a suitable analogy. | 6 |
| | (b) | What is a RESTful Web API? How is it used in IoT applications for device communication and data exchange? | 6 |
| | (c) | Compare symmetric and non-symmetric encryption standards. How are they applied in securing IoT communications? | 6 |
| Q6 | (a) | Explain about Network Function Virtualization (NFV). | 6 |
| | (b) | Describe the TCP protocol and its role in reliable data transmission within IoT systems. | 6 |
| | (c) | Explain the main components of an Arduino board and describe how inputs and outputs are handled. | 6 |
| Q7 | (a) | Explain the basics of IoT system management using NETCONF-YANG. | 6 |
| | (b) | Describe the features and functions of the Arduino Integrated Development Environment (IDE). How does it support program development and debugging? | 6 |
| | (c) | What are cloud storage APIs? How are they used to store and retrieve IoT data efficiently? | 6 |