

[This question paper contains 2 printed pages.]

Sr. No. of Question Paper : 5729

Your Roll No.....

Unique Paper Code: 2513012004

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Name of the Course: B.Sc. (H) Electronics (GE)

Name of the Paper: Internet of Things

Semester: VIII

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) | Write a short note on IoT architecture. | 3 |
| | (b) | What is Software Defined Networking (SDN)? | 3 |
| | (c) | Write a short note on CoAP protocol. | 3 |
| | (d) | Define an actuator and give two examples. | 3 |
| | (e) | What is IoT security? | 3 |
| | (f) | What are cloud service models? | 3 |
| Q2 | (a) | Explain the characteristics of IoT and discuss how these characteristics differentiate IoT systems from traditional internet systems. | 6 |
| | (b) | Explain the IoT protocol stack and discuss the protocols used in Link Layer, Network Layer, Transport Layer, and Application Layer. | 6 |
| | (c) | Describe the NETCONF protocol and YANG data modelling language and explain their importance in IoT system configuration and management. | 6 |
| Q3 | (a) | Explain the role of TCP protocol in IoT communication and discuss its advantages and limitations for IoT networks. | 6 |
| | (b) | Describe the working principle of temperature and humidity sensors used in IoT applications. | 6 |
| | (c) | Explain the Bluetooth communication protocol and discuss its role in short-range IoT device connectivity. | 6 |

- Q4 (a) Discuss the Arduino Integrated Development Environment (IDE) and explain the steps involved in writing, compiling, and uploading a program to an Arduino board. 6
- (b) Explain the UART communication protocol and discuss how it is used for communication between Arduino/Raspberry Pi and other devices. 6
- (c) Explain the basic structure of an Arduino sketch and describe the role of the **setup()** and **loop()** functions with suitable examples. 6
- Q5 (a) Explain the characteristics of cloud computing and discuss why cloud platforms are essential for IoT systems. 6
- (b) Explain different methods of device data storage in IoT systems. 6
- (c) Explain an IoT case study smart agriculture and describe how IoT technologies are implemented in that system. 6
- Q6 (a) Describe the difference between M2M communication and IoT systems. 6
- (b) Explain the importance of I/O interfaces in IoT hardware design and discuss how sensors and actuators communicate with microcontrollers. 6
- (c) Explain the working principle of MQTT protocol and discuss its communication model for IoT device. 6
- Q7 (a) Explain the ThingSpeak API and discuss how it is used for IoT data collection and visualization. 6
- (b) Discuss the role of Network Function Virtualization (NFV) in IoT networks and explain its advantages. 6
- (c) Explain the basics of IoT system management and discuss the role of SNMP in managing IoT devices. 6