

Serial No. 6664

[This Question Paper contains 2 pages]

Unique paper Code : 2513012004

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

Name of the Paper : Internet of Things

Semester : VIII

Duration : 3 Hr

Maximum Marks : 90 Marks

Instruction for Candidates

1. There are seven questions in all, out of which you have to attempt any five questions.
2. First Question is Compulsory.
3. All questions carry equal marks.

Q1. Attempt all questions. All questions carry equal marks.

(3 × 6 = 18)

- (a) What is CoAP protocol? Mention one IoT application.
- (b) Define M2M communication.
- (c) Differentiate between cloud computing and IoT.
- (d) What are actuators? Give one example.
- (e) Define NETCONF-YANG.
- (f) What is Bluetooth communication in IoT?

Q2.

- (a) Explain design principles and capabilities required in IoT systems. (6)
- (b) Explain functional blocks of IoT with neat diagram. (6)
- (c) Explain Publisher-Subscriber communication model with suitable example. (6)

Q3.

- (a) Discuss enabling communication protocols used in IoT such as MQTT, Bluetooth and TCP. (6)
- (b) Explain basics of networking in IoT systems. (6)
- (c) Differentiate between IoT and M2M systems with suitable examples. (6)

Q4.

- (a) Explain classification of sensors based on their applications with examples. (6)
- (b) Describe motion detection and light sensors used in IoT systems. (6)
- (c) Explain characteristics and working of ADC in IoT applications. (6)

Q5.

- (a) Explain Arduino board components and Arduino IDE.

OR

Explain Raspberry Pi GPIO library and basics of Python programming. (6)

- (b) Explain Arduino/Raspberry Pi compatible shields and their applications. (6)
- (c) Write a program to measure distance using ultrasonic sensor with Arduino/Raspberry Pi along with circuit diagram. (6)

Q6.

- (a) Explain cloud deployment models with suitable examples. (6)
- (b) Discuss IoT-cloud convergence and cloud storage APIs. (6)
- (c) Explain authentication and authorization of devices in IoT systems. (6)

Q7.

(a) A smart indoor air quality monitoring system is designed to monitor CO₂ and temperature levels inside a room. The system automatically activates an exhaust fan if the air quality exceeds a predefined threshold. Users can also manually control the fan using a web/mobile application.

Requirements:

- Real-time monitoring of indoor air quality
- Automatic exhaust fan control
- Manual control through web/mobile application
- Reliable wireless communication

Give the process model specification for Automatic Mode and Manual Mode of the system. (6)

(b) Explain any two of the following IoT applications: (6) + (6)

(i) Smart City

(ii) Weather Monitoring System

(iii) IoT in Retail