

315341

25226

3 Hours / 70 Marks

Seat No.

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- Instructions* – (1) All Questions are *Compulsory*.
(2) Answer each next main Question on a new page.
(3) Illustrate your answer with neat sketches wherever necessary.
(4) Figures to the right indicate full marks.
(5) Assume suitable data, if necessary.
(6) Mobile Phone, Pager and any other Electronic Communication devices are not permissible in Examination Hall.

Marks

- 1. Attempt any FIVE of the following: 10**
- a) Define the term Internet of Things.
 - b) List any four library functions of Arduino IDE.
 - c) List any four features of HTTP Protocol.
 - d) Compare UART and I2C communication protocol. (Any two points)
 - e) Draw block diagram of Electric Vehicles (EV) battery management using IoT.
 - f) Define the term Actuator.
 - g) State the use of setup() and loop() function of Arduino sketch.
 - h) Explain the use of MQ4 sensor.

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2. Attempt any THREE of the following: 12

- a) Draw the four stage IoT architecture and explain in brief.
- b) State the pins of MQ4 Gas sensor module and state the function of each pin.
- c) Explain the use of following pins of Node MCU:
 - i) EN
 - ii) RST
 - iii) Vin
 - iv) TX.
- d) State any four characteristics of IoT system and explain each.

3. Attempt any THREE of the following: 12

- a) Explain LoRa wireless communication platform.
- b) Explain in brief wireless sensor network as supporting technology for IoT.
- c) State four different IoT applications in the field of Healthcare industry.
- d) Write a program for Node MCU to operate onboard LED according to status of switch connected to Node MCU pin no D5.

4. Attempt any THREE of the following: 12

- a) List any four IoT applications in Industrial automation. Explain any one in brief.
- b) Explain the principle of working of PIR motion sensor for object distance detection.
- c) Explain MQTT topics in details with suitable examples.
- d) Draw and explain smart controlling of light intensity using Node MCU.
- e) Explain the principle of working of IR sensor with suitable sketch.

5. Attempt any TWO of the following:**12**

- a) Explain the following character functions of Arduino IDE:
 - i) Isdigit()
 - ii) isalpha()
 - iii) isalnum()
 - iv) isxdigit()
 - v) islower()
 - vi) is upper()
- b) Explain the pin details of DHT11 and LM35 sensors.
- c) Draw and explain Green House Control System using IoT.

6. Attempt any TWO of the following:**12**

- a) Write a program to turn ON/OFF the Home appliance connected to D2 pin via relay to Node MCU by using cloud server.
 - b) Give the format of serial data received via Data pin of DHT11 and Explain it.
 - c) List all the commands / methods of HTTP protocol and explain any four in brief.
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