315341

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) State any two need of internet of things.

b) Draw a neat block diagram of SPI device interface.

c) List four features of Node MCU.

d) State any two features of PIR sensor.

e) List any four advantages of HTTP-REST.

f) Define smart city in IoT context.

g) State cloud computing in IoT.

Marks

2. **Attempt any THREE of the following:** **12**

a) Explain any four enabling technologies in IoT.

b) Describe the function of cloud platforms in IoT communication protocols with example.

c) Explain working of steeper motor with phase energization.

d) Illustrate four layer architecture of IoT with neat sketch.

3. **Attempt any THREE of the following:** **12**

a) Illustrate the purpose of GPIO pins in Node MCU.

b) Demonstrate construction and working of MQ4 sensor.

c) Explain street light control system using Node MCU and LDR.

d) Compare MQTT and CoAP protocols in IoT with following four points :–

   i) Range

   ii) Networks type

   iii) Scalability

   iv) Reliability.

4. **Attempt any THREE of the following:** **12**

a) Explain any four characteristics and features of WiFi.

b) Illustrate the detailed communication process of LoRa with its two applications.

c) Demonstrate how LM35 sensors interfaces with Node MCU.

d) Describe the working of smart energy meter using sensors.

e) Explain different IoT system challenges for design and security.

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

a) Draw block diagram of Green house control using IoT and explain its parts.

b) Illustrate constructional details of IR sensor and explain its working in details.

c) Describe firmware and WiFi used with Node MCU and explain two features with example.

Marks

6. **Attempt any <u>TWO</u> of the following:** **12**

   a) Draw block diagram of EV battery management using IoT and explain each block in details.

   b) Explain the different technical specifications of Node MCU ESP8266. (Any six points)

   c) Explain the construction and operation of Relay with its applications.

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