DCEL603

VI Semester B.Sc. Degree Examination, July/August - 2024

ELECTRONICS

INTERNET OF THINGS AND ROBOTICS

(NEP - 2020 Scheme)

Paper : VIII

Time : 2½ Hours   **Maximum Marks : 60**

Instructions to Candidates:

1) Answer all the questions from Part 'A', any Four questions from part 'B', and any four from Part 'C'.

2) Answer all the questions of Part - 'A' in any one page and to be answered only once. In this part, answering the same questions answered multiple times will not be considered for evaluation.

PART - A

Answer all the questions.   **(12×1=12)**

1. i. Identify among the following which is not a fundamental component of IoT system.

   a. User interface

   b. sensors

   c. Transformers

   d. Connectivity and data processing

   ii. Which of the following actuator converts pressure into force?

   a. Mechanical actuators

   b. Pneumatic actuators.

   c. Electric actuators.

   d. Magnetic actuators.

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iii. Which of the following can measure position?

    a.   Potentiometer.

    b.   Encoder

    c.   Both potentiometer and encoder.

    d.   None of these.

iv. Which of the following is an example of vector sensor?

    a.   Pressure sensor.

    b.   Strain sensor.

    c.   Temperature sensor.

    d.   Sound sensor.

v. Which of the following is considered as long range radio used in IoT?

    a.   Bluetooth   b.   RFID.

    c.   LoRa   d.   None of them.

vi. _____ is a connection between parts or links in a robot that allow motion.

    a.   Hinge   b.   Joint.

    c.   Disjoint   d.   None of the above

vii. A Passive Infrared Ray (PIR) sensor is used for _____ ?

    a.   Humidity Detection.   b.   Tilt detection.

    c.   Obstacle detection   d.   Smoke detection.

viii. A random deviation of the signal that varies in time is called _____.

    a.   Noise   b.   Sound

    c.   Bias   d.   None of these

ix. Which of the following are challenges of IoT.

    a.   Security   b.   Complexity management.

    c.   Modeling and analysis.   d.   All of these.

x. Bluetooth technology.

    a. Bluetooth wireless technology is a long range communications technology.

    b. Intended for replacing cables connecting portable units.

    c. Maintains high levels of security.

    d. Bluetooth technology is based on Ad-hoc technology also known as Ad-hoc Piconets.

xi. In MQTT, _____ subscribes to a topic.

    a. Client   b. broker.

    c. Publisher   d. All of the above

xii. Which of the following is TRUE for the sketch command given below? delay (1000);

    a. Provides a delay of 1000 seconds

    b. Provides a delay of 1 second.

    c. Provides a delay of 1000 simulation time

    d. Provides a delay of 1 simulation time.

PART - B

Answer any Four questions.   (4×7=28)

2. Define IoT. With a neat block diagram, explain the architecture of IoT.

3. Define sensor. Explain static characteristics of sensors.

4. Explain the functionality of MQTT protocol. List the applications of MQTT data protocol.

5. Explain components of robot systems.

6. Explain device to device communication protocol in connection with IoT.

7. Explain the control statements used in Arduino programming.

PART - C

Answer any Four questions. (4×5=20)

8. Differentiate between scalar and vector sensors with an example.

9. Explain various message types available in CoAP data protocol.

10. Explain the salient features of Bluetooth communication protocol.

11. Differentiate between star network topology and mesh network topology.

12. Explain the features of Arduino Board.

13. Explain different data types available in programming Arduino.