Printed Page:- 03

Subject Code:- BCSIOT0303

Roll. No:

NOIDA INSTITUTE OF ENGINEERING AND TECHNOLOGY, GREATER NOIDA

(An Autonomous Institute Affiliated to AKTU, Lucknow)

B.Tech

SEM: III - THEORY EXAMINATION (2024 - 2025)

Subject: Introduction to IoT

Time: 3 Hours

Max. Marks: 100

General Instructions:

IMP: *Verify that you have received the question paper with the correct course, code, branch etc.*

1. This Question paper comprises of three Sections -A, B, & C. It consists of Multiple Choice Questions (MCQ's) & Subjective type questions.

2. Maximum marks for each question are indicated on right -hand side of each question.

3. Illustrate your answers with neat sketches wherever necessary.

4. Assume suitable data if necessary.

5. Preferably, write the answers in sequential order.

6. No sheet should be left blank. Any written material after a blank sheet will not be evaluated/checked.

SECTION-A 20

1. Attempt all parts:-

1-a. Select IoT characteristics [CO1] [K1] 1

(a) Interconnectivity

(b) Enormous Scale

(c) Dynamic Charges

(d) All of the above

1-b. Gather + _____ + Stream + Manage + Acquire + organize and Analyze = IBM Architecture Reference Model [CO1] [K1] 1

(a) Install

(b) Enrich

(c) Collaborate

(d) Enhance

1-c. The primary function of an actuator is [CO2] [K2] 1

(a) To convert electrical energy into mechanical motion

(b) To convert mechanical motion into electrical energy

(c) To store digital data

(d) To generate radio waves

1-d. Which of the following is an example of an electrical transducer? [CO2] [K2] 1

(a) Microphone

(b) Thermometer

(c) Barometer

(d) Telescope

1-e. Arduino IDE consists of the following two functions [CO3] [K2] 1

(a) Loop() and build() and setup()

(b) Build() and loop()

(c) Setup() and build()

(d) Setup() and loop()

1-f. What function is used to turn on an LED connected to an Arduino digital pin? [CO3] [K2] 1

(a) digitalWrite(pin, HIGH)

(b) analogWrite(pin, HIGH)

(c) digitalRead(pin, HIGH)

(d) pinMode(pin, OUTPUT)

1-g. What is the main advantage of BLE (Bluetooth Low Energy) over classic Bluetooth? [CO4] [K3] 1

(a) Higher data transfer rate

(b) Lower energy consumption

(c) Longer range

(d) Stronger encryption

1-h. Which of the following protocols is most suitable for low-power, wide-area networks (LPWAN) in IoT applications? [CO4] [K3] 1

(a) Zigbee

(b) LoRa

(c) Wi-Fi

(d) BLE

1-i. Which of the following components in a smart grid forward the energy consumption information from the home appliances to the gateways. [CO5] [K4] 1

(a) Gateways

(b) Smart Meter

(c) PHeV

(d) None of these

1-j. The desirable characteristics of an IoT sensor node are [CO5] [K4] 1

(a) Energy-efficiency

(b) Distributed sensing

(c) Low-cost

(d) All of the above

2. Attempt all parts:-

2.a. List any 3 characteristics of IoT [CO1] [K1] 2

2.b.	Define active sensor. [CO2] [K1]	2
2.c.	What do you understand by sketch [CO3] [K2]	2
2.d.	Enlist methods of Node discovery in WSN. [CO4] [K3]	2
2.e.	What is Thing speak in IoT? [CO5] [K2]	2

SECTION-B 30

3. Answer any five of the following:-

3-a.	Describe history of Internet of things. [CO1] [K1]	6
3-b.	Is M2M is subset of IoT? Justify [CO1] [K1]	6
3-c.	Compare active sensor and passive sensor with example. [CO2] [K3]	6
3-d.	Based on data type define sensor classes. [CO2] [K2]	6
3.e.	Program the arduino Uno with DHT 11 sensor. Explain with circuit diagram. [CO3] [K4]	6
3.f.	Differentiate Zigbee and BLE protocol. [CO4] [K3]	6
3.g.	What is big Data and how it is useful in IoT? [CO5] [K4]	6

SECTION-C 50

4. Answer any one of the following:-

4-a.	List any 5 features of oracle IoT architecture. [CO1] [K1]	10
4-b.	What is the difference between monitoring home surveillance using Internet of Things and a central server? [CO1] [K3]	10

5. Answer any one of the following:-

5-a.	Explain concept of Ultrasonic sensor with neat and clean diagram. [CO2] [K2]	10
5-b.	Design an iot application and its use cases using smoke sensor(MQ135). [CO2] [K6]	10

6. Answer any one of the following:-

6-a.	Write a Arduino sketch to implement switch case statement used with serial input with circuit. [CO3] [K4]	10
6-b.	Create a sketch and circuit to show the interfacing of potentiometer with arduino Uno. Write code to control LED brightness with potentiometer. [CO3] [K6]	10

7. Answer any one of the following:-

7-a.	How does the layered architecture of IoT protocols enable a smart agriculture system to monitor soil moisture, temperature, and humidity remotely? [CO4] [K3]	10
7-b.	Explain how MQTT works. Provide various QoS levels of MQTT. [CO4] [K2]	10

8. Answer any one of the following:-

8-a.	What are the primary objectives of automating a city's infrastructure and services? How can automation contribute to sustainability and resource optimization in a smart city? [CO5] [K3]	10
8-b.	How does e-health improve healthcare accessibility and efficiency? Identify the sensors which can contribute for healthcare use cases. [CO5] [K6]	10