Printed Page:-03 **Subject Code**:- **ACSIOT0303**

Roll. No:

NOIDA INSTITUTE OF ENGINEERING AND TECHNOLOGY, GREATER NOIDA

(An Autonomous Institute Affiliated to AKTU, Lucknow)

B.Tech

SEM: III - THEORY EXAMINATION (2023- 2024)

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. An IoT network is a collection of _____ devices. [CO1] 1

(a) Signal
(b) Machine to Machine
(c) Interconnected
(d) Network to Network

1-b. NFC Stands for [CO1] 1

(a) Near Field Communication
(b) Next Field Communication
(c) New Field Communication
(d) Near Field Capabilities

1-c. Input Voltage limit of arduino Uno is [CO2] 1

(a) 5-12 V
(b) 6-12 V
(c) 8-12 V
(d) 6-20 V

1-d. No line of sight required for reading in (CO2) 1

(a) RFID
(b) Barcode
(c) both A and B

(d) None of the above

1-e. Which port is used to power the raspberry pi device? [CO3] 1

(a) HDMI port
(b) Ethernet port
(c) Micro USB power port
(d) None

1-f. Select the use of ESP8266 WiFi module [CO3] 1

(a) Monitors motion
(b) Evaluates air pressure
(c) Network provider
(d) Switches circuit

1-g. Which one of the following protocols is lightweight? [CO4] 1

(a) IP
(b) HTTP
(c) MQTT
(d) CoAP

1-h. Full form of XMPP [CO4] 1

(a) Extensible Management and Presence Protocol
(b) Extensible Messaging and Privacy Protocol
(c) Extensible Messaging and Presence Protocol
(d) Extensible Management and Privacy Protocol

1-i. Which of following is not a cloud server [CO5] 1

(a) Microsoft Azure
(b) ThingSpeak
(c) ANOVA
(d) IBM Bluemix

1-j. IIoT is mainly focused on (CO5) 1

(a) Convenience of individuals
(b) Efficiency, safety and security of operation and individuals
(c) Efficiency of the system.
(d) Data security.

2. Attempt all parts:-

2.a. Define data enrichment [CO1] 2

2.b. List 2 applications of servo motor in context of automotive IoT [CO2] 2

2.c. How many digital pins are there in arduino Uno ? [CO3] 2

2.d. What is broker in MQTT? [CO4] 2

2.e. Enlist Components of Smart Grid. [CO5] 2

SECTION-B 30

3. Answer any five of the following:-

3-a.	Explain any four characteristics of IoT in brief. [CO1]	6
3-b.	Differentiate between IoT and M2M. [CO1]	6
3-c.	Differentiate between active and passive tag [CO2]	6
3-d.	Explain types of actuators in brief. [CO2]	6
3.e.	Write a program using Arduino uno to glow red LED if distance of ultrasonic sensor is less than 20 CM from an object. Else glow green LED. [CO3]	6
3.f.	Explain Bluetooth Low-Energy (BLE) protocol process. [CO4]	6
3.g.	How Blynk is useful for remote monitoring and controlling. [CO5]	6

SECTION-C 50

4. Answer any one of the following:-

4-a.	Explain the relevance of OSI model in context to IoT reference model. [CO1]	10
4-b.	Architect class notice board use case for your class in line with IoT. [CO1]	10

5. Answer any one of the following:-

5-a.	Draw and explain components of NodeMCU. [CO2]	10
5-b.	What are the uses of analog sensors justify with example. [CO2]	10

6. Answer any one of the following:-

6-a.	Write a program using Arduino uno to generate a random number in between 0 to 25. Use 4 LEDs (Red, Green, Blue, Yellow) and design LED patterns as [CO3] (i) if random number is less than 5 then only Red LED should glow. (ii) if random number is in between 5-10 then only Blue LED should glow. (iii)if random number is in between 11-20 then only Yellow LED should glow. (iv) if random number is greater than 20 then only Green LED should glow.	10
6-b.	Draw a circuit diagram and code to interface ESP8266 with the LDR sensor. [CO3]	10

7. Answer any one of the following:-

7-a.	Differentiate in between Zigbee, LoRa, Z-Wave, BLE and NFC in terms of range , Speed, Frequency, power consumption and network topology. [CO4]	10
7-b.	Describe layered architecture of IoT Protocols. Explain in detail. [CO4]	10

8. Answer any one of the following:-

8-a.	Explain the concept of smart metering with suitable use cases. [CO5]	10
8-b.	Discuss design of smart garbage collection in smart cites using raspberry-pi. [CO5]	10