NOIDA INSTITUTE OF ENGINEERING AND TECHNOLOGY, GREATER NOIDA

(An Autonomous Institute Affiliated to AKTU, Lucknow)

B.Tech.

SEM: V - THEORY EXAMINATION (2022 - 2023)

Subject: IoT Architecture and Protocols

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.   Near Field Communication (NFC) is based on principal of _____. (CO1)   1

        (a) Reflection

        (b) Refraction

        (c) Magnetic induction

        (d) Electric Conduction

1-b.   _____ are the devices that are able to emit, accept and process data over the   1
network. (CO1)

        (a) Sensors

        (b) Gateways

        (c) Edge IT

        (d) Data Acquisition

1-c.   VNC stands for _____. (CO2)   1

        (a) Virtual Network Communication

        (b) Virtual Network Computing

(c) Virtual Network Computer

(d) None

1-d.   _____ is an open source software project enabling seamless device-to-device   1
connectivity where billions of wired and wireless Internet of Things (IoT) devices can
securely connect to each other and to the internet. (CO2)

(a) Sensors

(b) Protocol abstraction

(c) Network Server

(d) IoTivity

1-e.   IPv6 is a _____. (CO3)   1

(a) 64 bit IP address

(b) 128 bit IP address

(c) 10 decimal digit IP address

(d) 32 bit IP address

1-f.   Full form of XMPP_____. (CO3)   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-g.   Machine-to-Machine (M2M) is designed for _____. (CO4)   1

(a) isolated systems using proprietary solutions

(b) cross platform integration

(c) home automation only

(d) none of the above

1-h.   The RFID tags consists of an _____. (CO4)   1

(a) Antenna

(b) Integrated circuit

(c) Both a and b

(d) None of the above

1-i.   What is an IoT network? (CO5)   1

(a) a collection of networked devices

(b) a collection of Interconnected devices

(c) a collection of signalled devices

(d) None of the above

1-j.   Which of the following things is mandatory for the IoT gateway to provide? (CO5)   1

(a) Simple and secure installation

(b) Data network and storage

(c) Software Security

(d) Protocol abstraction

2. Attempt all parts:-

2.a.   Mention what are the components of IoT are? (CO1)   2

2.b.   Analyze the application layer. (CO2)   2

2.c.   What is need Lightweight protocols in smart cities? (CO3)   2

2.d.   Write down any two features of RFID. (CO4)   2

2.e.   Mention two characteristics of IoT. (CO5)   2

<div align="center">SECTION B   30</div>

3. Answer any <u>five</u> of the following:-

3-a.   How can we develop Node? How Many Nodes Can Connect To A Single Gateway? (CO1)   6

3-b.   What is IoT? Explain IoT architecture. (CO1)   6

3-c.   How LoRa is better then Wi-Fi for bigger area? (CO2)   6

3-d.   Describe in detail about the IoT reference model. (CO2)   6

3.e.   Explain BLE frame format in details. (CO3)   6

3.f.   Discuss M2M communications process in brief. (CO4)   6

3.g.   Explain WoT (Web of Things). (CO5)   6

<div align="center">SECTION C   50</div>

4. Answer any <u>one</u> of the following:-

4-a.   Explain three layer and five Layered Architecture of IoT Protocols in details. (CO1)   10

4-b.   Describe all hardware components needed for implementation of an IoT devices. (CO1)   10

5. Answer any <u>one</u> of the following:-

5-a.   Explain LoRaWAN network architecture, its elements and network interfaces. (CO2)   10

5-b.   Write short note on- (CO2)   10

a) IoTivity

b) OIC

6. Answer any <u>one</u> of the following:-

6-a.   Write short note on XMPP and CoAP. (CO3)   10

6-b.   Make a node and sense temperature and humidity using DHT-11 and transmitted the sensed   10
                data to mobile phone located at distant location using Bluetooth protocol. (CO3)

7. Answer any <u>one</u> of the following:-

7-a.   Define RFID tag and RFID reader. Also write down the various features and specifications   10
                of RFID. (CO4)

7-b.   What do you understand by Unified Data Standards? Explain with diagram. (CO4)   10

8. Answer any <u>one</u> of the following:-

8-a.   Draw the block diagram which represents the basic concept of Business Intelligence. (CO5)   10

8-b.   Write short note on: (CO5)   10
                a) Web Browsers HTML
                b) Application Servers URL