Printed Page:- Subject Code:- AEC0403

Roll. No:

NOIDA INSTITUTE OF ENGINEERING AND TECHNOLOGY, GREATER NOIDA

(An Autonomous Institute Affiliated to AKTU, Lucknow)

B.Tech

SEM: IV - THEORY EXAMINATION (2021 - 2022)

Subject: Internet of Things

Time: 3 Hours Max. Marks: 100

General Instructions:

1. The question paper comprises three sections, A, B, and C. You are expected to answer them as directed.
2. Section A - Question No- 1 is 1 marker & Question No- 2 carries 2 mark each.
3. Section B - Question No-3 is based on external choice carrying 6 marks each.
4. Section C - Questions No. 4-8 are within unit choice questions carrying 10 marks each.
5. 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. Which protocol is used to link all the devices in IoT? (CO1) 1

(a) HTTP
(b) UDP
(c) Network
(d) TCP/IP

1-b. Which of the following IoT networks has a very short range? (CO1) 1

(a) Short Network
(b) LPWAN
(c) SigFox
(d) Short-range Wireless Network

1-c. According to the analysis on IoT application framework, smart grid is divided into ……. (CO2) 1

(a) 2 layers
(b) 3 layers
(c) 4 layers
(d) 5 layers

1-d. The ARM instruction set architecture is divided into _____ classes of instructions. (CO2) 1

(a) Two
(b) Four
(c) Six
(d) Eight

1-e. Which library is used to access I2C in Arduino IoT devices? (CO3) 1

(a) EEPROM
(b) Wire
(c) DHT11
(d) ArduinoJson

1-f. What is the frequency of the Galileo gen 2 board? (CO3) 1

(a) 250MHz
(b) 400MHz
(c) 450MHz

(d) 300MHz

1-g. The architecture of the XMPP network is similar to _____. (CO4) 1

(a) Chat box
(b) Web browser
(c) Gaming
(d) Email

1-h. Li-Fi technology connects to the Internet using _____ source. (CO4) 1

(a) Plugin
(b) Voltage source
(c) Light
(d) Firewall

1-i. Process of digitally signing softwares on an IoT device is called _____. (CO5) 1

(a) secure code
(b) code signing
(c) digital signature
(d) none of the above

1-j. Name the three factors involved in handling IoT data at the edge. (CO5) 1

(a) speed, volume, bandwidth
(b) speed, quality of service, latency
(c) latency, security, bandwidth
(d) volume, latency, bandwidth

2. Attempt all parts:-

2.a. Mention the two risks that emerges with IoT adoption. (CO1) 2

2.b. State the types of registers of ARM Cortex M4 microcontroller. (CO2) 2

2.c. Define resolution of an ADC. (CO3) 2

2.d. Mention the various types of protocols that are used in IoT. (CO4) 2

2.e. Define Asymmetric Encryption. Name any two algorithms used for it. (CO5) 2

SECTION B 30

3. Answer any five of the following:-

3-a. Differentiate between sensors and actuators with examples. (CO1) 6

3-b. Explain TCP/IP layer model with diagram. (CO1) 6

3-c. Draw the register set of an ARM Cortex M4 processor and explain the functions of these registers. (CO2) 6

3-d. Describe the identity and access management in five layered architecture of IoT. (CO2) 6

3.e. Explain the various types of interfaces in Raspberry Pi. (CO3) 6

3.f. Write short note on E-health and its applications in IoT. (CO4) 6

3.g. Illustrate the role of Platform Security Architecture (PSA) in IoT. (CO5) 6

SECTION C 50

4. Answer any one of the following:-

4-a. Explain link layer protocols with examples. (CO1) 10

4-b. Define microcontrollers. Explain the basic hardware description of the arduino uno board. (CO1) 10

5. Answer any one of the following:-

5-a. Illustrate cloud computing. Explain the various cloud deployment models. (CO2) 10

5-b. With the help of neat sketches discuss the differences between cloud, fog and edge computing paradigms. (CO2) 10

6. Answer any one of the following:-

6-a.	With the help of neat diagram explain the working of Arduino Uno. (CO3)	10
6-b.	Draw the pin diagram of Raspberry Pi 4 model B and explain the various functions of its GPIO pins. (CO3)	10

7. Answer any one of the following:-

7-a.	Write short note on: (CO4) a) Li-Fi b) Wi-Fi	10
7-b.	State and explain the differences between Bluetooth and Bluetooth LE. Define Zigbee alliance. (CO4)	10

8. Answer any one of the following:-

8-a.	Explain the principles of encryption and its need in IoT. (CO5)	10
8-b.	Demonstrate the iterative approach that is used for implementation of smart city solutions. (CO5)	10