NOIDA INSTITUTE OF ENGINEERING AND TECHNOLOGY, GREATER NOIDA
(An Autonomous Institute Affiliated to AKTU, Lucknow)
B. Tech
SEM: IV - THEORY EXAMINATION - (2023 - 2024)
Subject: Internet of Things

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.　　　Which of the following is not a fundamental component of an IoT system? (CO1)　　1

　　(a)　　Sensors

　　(b)　　Connectivity and data processing

　　(c)　　User interface

　　(d)　　Transformer

1-b.　　　Which of the following is the way in which an IoT device is associated with data?　　1
　　　　　(CO1)

　　(a)　　Internet

　　(b)　　Cloud

　　(c)　　Automata

　　(d)　　Network

1-c.　　　Edge computing is also known as _____.(CO2)　　1

　　(a)　　Cloud

　　(b)　　None

　　(c)　　Fog

　　(d)　　Edge

1-d.　　　IoT gateway must provide (CO2)　　1

　　(a)　　Simple and fast installation

　　(b)　　Security with hardware

(c) Data storage

(d) Protocol abstraction

1-e.   Which of the following is true about Arduino IoT devices?(CO3)   1

(a) They are open-source software

(b) They can only read analog inputs

(c) They have their own operating systems

(d) They don't have pre-programmed firmware

1-f.   Which of the following type output is provided by ADC? (CO3)   1

(a) Serial type

(b) Parallel type

(c) Both serial and parallel type

(d) None of these

1-g.   Which of the following is not an IoT communication model?.(CO4)   1

(a) Request- Response

(b) Push-Producer

(c) Publish-Subscribe

(d) Push-Pull

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.   In asymmetric key cryptography, the private key is kept by _____.(CO5)   1

(a) Receiver

(b) sender and receiver

(c) Sender

(d) all the connected devices to the network

1-j.   Which of the following is not a correct way to secure communication layer?   1
         (CO5)

(a) Cloud initiated communication

(b) TLS/SSL

(c) IPS(Intrusion Prevention System)

(d) Firewalls

2. Attempt all parts:-

2.a.   Write any two challenges in IoT. (CO1)   2

2.b.   Write the name of different layers in the layered architecture of IoT. (CO2)   2

2.c.   What is the use of PWM pins in Arduino Uno? (CO3)   2

2.d.   Why do we need IoT Protocols?(CO4)   2

2.e.	What do you mean by IoT Security? (CO5)	2

SECTION-B 30

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

3-a.	Explain TCP/IP layer model with diagram. (CO1)	6
3-b.	What is the concept of IoT? Explain with the help of a suitable diagram. (CO1)	6
3-c.	Discuss the differences between cloud, fog and edge computing paradigms.(CO2)	6
3-d.	Describe the memory management of an ARM Cortex M4.(CO2)	6
3-e.	Explain the role of GPIO pins in Raspberry Pi 4 development board. (CO3)	6
3-f.	What is Bluetooth? Explain its various advantages with real life examples. (CO4)	6
3-g.	Illustrate the role of Platform Security Architecture (PSA) in IoT. (CO5)	6

SECTION-C 50

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

4-a.	With the help of suitable examples describe the main technologies that enables IoT. (CO1)	10
4-b.	What are three main IoT project risks that prevent companies from adopting IoT solutions? (CO1)	10

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

5-a.	With the help of neat diagram Discuss the five layered architecture model of IoT. Explain the importance of this model. (CO2)	10
5-b.	Write the evolution of various ARM processor families. Discuss the differences between them. (CO2)	10

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

6-a.	With the help of a neat diagram explain the working principle of any type of analog to digital converter. What are its applications? (CO3)	10
6-b.	Elaborate the significant use of Raspberry Pi in Smart cities and Industrial appliances. (CO3)	10

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

7-a.	Explain NFC Communication technology. Also discuss about its communication modes, standard frequency range and its data rate.(CO4)	10
7-b.	Consider a smart e-health monitoring system as per your choice. Explain the components and working of this system along with its applications. (CO4)	10

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

8-a.	Demonstrate the iterative approach that is used for implementation of smart city solutions. (CO5)	10
8-b.	What is threat modelling ? Discuss the basic principle of encryption. What are the differences between symmetric and asymmetric encryption? (CO5)	10