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Subject Code:- ACSBS0712

Roll. No:

NOIDA INSTITUTE OF ENGINEERING AND TECHNOLOGY, GREATER NOIDA

(An Autonomous Institute Affiliated to AKTU, Lucknow)

B.Tech

SEM: VII - 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. What does IoT stand for? (CO1,K1) 1

(a) Internet of Things

(b) Internet of Technology

(c) Internet of Communication

(d) Internet of Computers

1-b. Which of the following is not a fundamental building block of IoT? (CO1,K1) 1

(a) Sensors

(b) Connectivity

(c) Cloud computing

(d) Robotics

1-c. What does IIoT stand for? (CO2, K1) 1

(a) Industrial Internet of Things

(b) Internet of Industrial Things

(c) Integrated Industrial Technology

(d) Intelligent Internet of Things

1-d. Which technology is commonly used for real-time analytics in IoT systems? (CO2,K1) 1

(a) TensorFlow

(b) Apache Flink

(c) MongoDB
(d) PostgreSQL

1-e. What is the function of a sensor? (CO3,K1) 1

(a) To process industrial data
(b) To control industrial systems
(c) To measure physical quantities
(d) To integrate with sensor processing boards

1-f. Which component converts a physical parameter into an electrical signal? (CO3,K1) 1

(a) Transducer
(b) Data acquisition system
(c) Control system
(d) Sensor processing board

1-g. Which layer of the OSI model is responsible for physical transmission and electrical signaling? (CO4, K1) 1

(a) Application Layer
(b) Presentation Layer
(c) Physical Layer
(d) Session Layer

1-h. Which layer of the OSI model handles routing and addressing? (CO4,K1) 1

(a) Data Link Layer
(b) Network Layer
(c) Transport Layer
(d) Physical Layer

1-i. What is the primary reason for utilizing time-series databases in IoT applications? (CO5 ,K1) 1

(a) To handle structured data effectively
(b) To process data from a single source
(c) To analyze historical data
(d) To manage time-stamped data efficiently

1-j. Which method is commonly used for summarizing large volumes of IoT time series data without losing significant information? (CO5, K1) 1

(a) Data smoothing
(b) Downsampling
(c) Moving averages
(d) Interpolation

2. Attempt all parts:-

2.a. Name two fundamental building blocks of IoT. (CO1, K1) 2

2.b.	What is the role of IoT gateways in an IoT system? (CO2, K1)	2
2.c.	Define a sensor. (CO3, K2)	2
2.d.	What does OSI stand for? (CO4, K1)	2
2.e.	What is time series data? (CO5,K1)	2

SECTION-B 30

3. Answer any five of the following:-

3-a.	Discuss the fundamental building blocks of an IoT architecture, highlighting their importance. (CO1, K2)	6
3-b.	Describe the challenges faced in implementing IoT in large-scale industrial systems and suggest possible solutions. (CO1, K2)	6
3-c.	Discuss the role of edge computing in optimizing IoT deployments, considering factors such as latency, bandwidth, and data processing. (CO2,K2)	6
3-d.	Compare and contrast the centralized and distributed architectures for IoT systems, highlighting their advantages and limitations. (CO2, K2)	6
3.e.	Compare and contrast active and passive sensors in industrial applications. (CO3, K2)	6
3.f.	Compare and contrast ZigBee and Z-Wave as proximity networking technologies in IoT. (CO4,K2)	6
3.g.	Discuss the challenges associated with processing and analyzing large-scale time series data in IoT applications. (CO5, K2)	6

SECTION-C 50

4. Answer any one of the following:-

4-a.	Discuss the concept of Internet of Things (IoT) and its significance in the digital era, highlighting its potential applications across various industry domains. (CO1, K2)	10
4-b.	Describe the fundamental building blocks of an IoT system, including devices, connectivity, and data processing, and discuss their interdependencies and roles in enabling IoT applications. (CO1, K2)	10

5. Answer any one of the following:-

5-a.	Discuss the key components and layers in an IoT reference architecture and their roles in building scalable and efficient IoT systems.(CO2, K2)	10
5-b.	Discuss the concept of edge computing in the context of IoT systems, including its advantages, challenges, and potential use cases. (CO2, K2)	10

6. Answer any one of the following:-

6-a.	Discuss the role of sensors and transducers in industrial systems, highlighting their importance in data acquisition and control processes. (CO3, K2)	10
6-b.	Explain the integration of sensors with sensor processing boards, discussing the benefits and challenges of this approach in industrial applications. (CO3, K2)	10

7. Answer any one of the following:-

7-a.	With the help of a neat diagram explain the seven layer architecture of OSI model. Also explain the mapping of this model to IoT architecture.(CO4, K2)	10
7-b.	Analyze the impact of 5G technology on IoT communication, including its benefits and challenges. (CO4 ,K3)	10

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

8-a.	Discuss the challenges of storing and processing time series data in IoT systems and propose solutions to address them. (CO5, K2)	10
8-b.	Discuss the challenges and techniques for handling concept drift in time series analysis. (CO5, K2)	10