Roll No: | | | | | | | | | | | |

GAIN MORE KNOWLEDGE
REACH GREATER HEIGHTS

PRESIDENCY UNIVERSITY

Presidency University Act, 2013 of the Karnataka Act No. 41 of 2013 | Established under Section 2(f) of UGC Act, 1956
Approved by AICTE, New Delhi | Approved By BCI
Bengaluru

Mid Term Examinations - October 2026

Date: 06/10/2026 **Time:** 09:30 AM - 11:00 AM

Course Code: ECE3082 **Course Name:** Data Science for IoT

Semester: Seventh Semester **Max. Marks:** 50 **Weightage:** 50%

CO - Levels	CO1	CO2	CO3	CO4
Marks	22	24	24	20

PART A: Answer Following Questions. 10 M

Q.N.	Questions	M	CO	BT
1	Give two examples of IoT Systems?	2	CO1	BT1
2	What is M2M ? State an example M2M network	2	CO2	BT1
3	Give names of any 2 M2M protocols.	2	CO2	BT2
4	Give 2 examples of big data?	2	CO3	BT1
5	Give 2 examples of Cloud Storage.	2	CO3	BT1

PART B : Answer Any 1 Following Questions. 10 M

Q.N.	Questions	M	CO	BT
6	Discuss the foundational architecture of an IoT ecosystem. Explain the four-tier architectural model (Perception, Network, Middleware/Processing, and Application layers) with a structural diagram, and detail the primary responsibilities and protocols associated with each tier.	10	CO1	BT2
7	Define the essential terminology and foundational concepts that govern IoT ecosystems. Specifically, analyze the concepts of "Things," Identifiers & Addressing Schemes, Device Virtualization (Digital Twins), and the trade-offs between Edge vs. Cloud computing models.	10	CO1	BT2

PART C: Answer Any 1 Following Questions. 10 M

Q.N.	Questions	M	CO	BT
8	Conduct a comprehensive comparative analysis of key IoT application-layer protocols (MQTT, CoAP, and AMQP) against traditional M2M protocols (Modbus and OMA-LwM2M). Evaluate their underlying transport layers, architectural paradigms, packet/header overheads, Quality of Service (QoS) mechanisms, and typical industry use cases.	10	CO2	BT3
9	Analyze the architectural frameworks of M2M and IoT. Detail the oneM2M standardized framework and compare it with modern open IoT cloud frameworks (such as ThingsBoard or AWS IoT Core). In your answer, contrast horizontal service layer architectures with vertical IoT solution silos.	10	CO2	BT3

PART D: Answer Any 1 Following Questions. 10 M

Q.N.	Questions	M	CO	BT

10	Analyze the architectural convergence of Big Data and Cloud Computing. Explain how modern cloud infrastructure addresses the core challenges of Big Data (Volume, Velocity, Variety), detail the shared-disk versus shared-nothing processing models, and evaluate the architectural shift toward the decoupling of compute and storage.	10	CO3	BT3
11	Examine modern distributed storage architectures for Big Data and Cloud systems. Compare Distributed File Systems (HDFS), Cloud Object Stores (Amazon S3 / Google Cloud Storage), and Lakehouse Table Formats (Apache Iceberg / Delta Lake). Discuss the trade-offs between POSIX compliance, eventual vs. strong consistency, and ACID transaction support.	10	CO3	BT3

PART E: Answer Any 1 Following Questions. 10 M				
Q.N.	**Questions**	**M**	**CO**	**BT**
12	Illustrate how Apache Hadoop and distributed data analytics frameworks are applied to solve large-scale enterprise problems. Design an end-to-end Big Data architecture for an e-commerce platform handling massive clickstream logs, detailing the data flow through Ingestion, Storage (HDFS), Batch & Stream Analytics (MapReduce/Spark), and Consumption.	10	CO4	BT3
13	Examine how the four stages of Data Analytics (Descriptive, Diagnostic, Predictive, and Prescriptive) are operationalized in an Industrial IoT (IIoT) smart manufacturing environment. Provide a detailed, step-by-step technical implementation illustrating how raw machinery telemetry ingested into a Hadoop/Lakehouse ecosystem is converted into automated predictive maintenance and prescriptive actions.	10	CO4	BT3