8E1910

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B.Tech. VIII Sem. (Main/Back) Examination, April/May - 2025
Information Technology
8IT4-01 Internet of Things

Time : 3 Hours **Maximum Marks : 70**

Instructions to Candidates:

Attempt all Ten questions from Part A, Five questions out of seven questions from Part B and Three questions out of five questions from Part C.

Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly. Units of quantities used/calculated must be stated clearly.

Use of following supporting material is permitted during examination. (Mentioned in form No. 205).

PART - A
(Answer should be given up to 25 words only)

All questions are compulsory. **(10×2=20)**

1. Define the Internet of Things (IoT). Also state main component of IoT.
2. What is the difference between physical and logical design in IoT?
3. What is the function of a sensor in an IoT system?
4. Name two applications of ultrasonic sensors in IoT.
5. Define an actuator and give an example.
6. What is a Uniform Resource Identifier (URI)?
7. What are the main layers in the IoT reference model?
8. Name two design challenges in IoT.
9. How does Software-Defined Networking (SDN) benefit IoT?
10. Compare Tiny OS and Contiki OS.

PART - B
(Analytical / Problem Solving Questions)

Attempt any Five questions. **(5×4=20)**

1. Evaluate how big data analytics enhances IoT decision-making processes.
2. Compare the advantages and limitations of using Arduino and Raspberry Pi in IoT projects.
3. Describe the functionalities of different operating systems (LiteOS, RIoTOS, Contiki OS, Tiny OS) in IoT.
4. Compare RESTful architecture with traditional IoT communication models.
5. Analyze the impact of security challenges on the deployment of IoT systems in healthcare.
6. Explain the roles of sensors and actuators in IoT systems with real-life examples.
7. What is Network Function Virtualization (NFV)? Also analyze the role of SDN and NFV in improving IoT scalability and flexibility.

PART - C
(Descriptive / Analytical / Problem Solving / Design Questions)

Attempt any Three questions. **(3×10=30)**

1. Explain the IoT architecture and reference model, focusing on its components and functionalities.
2. Explain the design, development, and security challenges faced during IoT implementation.
3. Design an IoT solution for smart agriculture that integrates M2M communication and SDN.
4. Design an IoT based home automation system that includes security, lighting, and energy management features.
5. Discuss the applications of IoT in various domains like healthcare, agriculture, and smart cities.

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B.Tech. VIII-Sem. (Main/Back) Examination, April/May - 2025
Computer Science and Engineering (A.I)
8CA14-01 Big Data Analytics
CS, CAI

Time : 3 Hours **Maximum Marks : 70**

Instructions to Candidates:

Attempt all Ten questions from Part A, Five questions out of seven questions from Part B and Three questions out of five questions from Part C.

Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly. Units of quantities used/calculated must be stated clearly.

Use of following supporting material is permitted during examination. (Mentioned in form No. 205).

PART - A

(Answer should be given up to 25 words only)

All questions are compulsory. **(10×2=20)**

1. What are the key features of Big Data?
2. Define the 3V's of Big Data with examples.
3. What is the Google File System (GFS) and its purpose?
4. Explain the role of NameNode and DataNode in Hadoop.
5. What is combiner in MapReduce framework?
6. Define Writable comparable in Hadoop I/O.
7. What are Hive clients? List different types of Hive clients.
8. What is Pig Latin? Mention its importance in Big Data processing.
9. What is the difference between Mapper and Reducer in MapReduce?
10. What is Record Reader in Hadoop?

PART - B

(Analytical / Problem Solving Questions)

Attempt any Five questions. **(5×4=20)**

1. Explain the HDFS architecture with a neat diagram.
2. Describe the workflow of MapReduce program with an example dataset.
3. What is Writable class hierarchy in Hadoop? Explain its importance in Big Data processing.
4. Discuss the Pig architecture with its main components.

5. Explain how MapReduce handles data partitioning and the role of the partitioner.
6. Write a Hive QL query to create a table, insert data, and perform basic operations like filtering and grouping.
7. Describe the Hadoop I/O operations and explain how data serialization works.

PART - C

(Descriptive / Analytical / Problem Solving / Design Questions)

Attempt any Three questions. **(3×10=30)**

1. Explain the complete building blocks of Hadoop. Draw the block diagram and explain the roles of NameNode, DataNode, Job Tracker, and Task Tracker.
2. What is MapReduce? Describe its working principle with a suitable example, including the Mapper, Reducer, and Combiner phases.
3. Write and explain a Pig Script to analyze a weather dataset. Perform operations like filtering, grouping, and sorting.
4. Explain Hive data types and querying techniques. Write Hive QL queries to create tables, load data, and perform basic data analysis operations.
5. Difference between the following:
   a) Hive and Pig.
   b) HDFS and traditional file systems.
   c) MapReduce and Traditional data processing techniques.

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B.Tech. VIII Sem. (Main/Back) Examination, April/May - 2025
Artificial Intelligence and Data Science
8AID4 - 01 Deep Learning and Its Applications

Time : 3 Hours **Maximum Marks : 70**

Instructions to Candidates:

Attempt all Ten questions from Part A, Five questions out of seven questions from Part B and Three questions out of five questions from Part C.

Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly. Units of quantities used/calculated must be stated clearly.

Use of following supporting material is permitted during examination. (Mentioned in form No. 205).

PART - A
(Answer should be given up to 25 words only)

All questions are compulsory. **(10×2=20)**

1. Define the term "Deep Learning" and its significance in Artificial Intelligence.
2. What is the curse of dimensionality in machine learning?
3. Write two activation functions in neural networks.
4. What is the difference between supervised and unsupervised training of neural networks?
5. Define the concept of "Backpropagation" in neural networks.
6. What are Restricted Boltzmann Machines (RBMs)?
7. What is the purpose of parameter sharing in CNNs?
8. Define Bidirectional Recurrent Neural Networks (BRNNs).
9. Explain the concept of stochastic gradient descent.
10. Differentiate between regularized and stochastic autoencoders.

PART - B
(Analytical / Problem Solving Questions)

Attempt any Five questions. **(5×4=20)**

1. Given a dataset with high dimensionality, explain how you would address the curse of dimensionality using deep learning techniques.
2. Design a simple neural network with three layers for binary classification and explain its working.
3. Analyse the effect of using different activation functions on a neural network's performance, explain with example.
4. Solve for the updated weights using backpropagation for a single-layer perceptron with given inputs, weights, and target outputs.
5. Given a sequence prediction problem, propose how you would implement an RNN to solve it.
6. Explain how dropout regularization can prevent overfitting in deep learning models with an example.
7. Design a simple autoencoder for dimensionality reduction and explain its components.

PART - C
(Descriptive / Analytical / Problem Solving / Design Questions)

Attempt any Three questions. **(3×10=30)**

1. Describe the architecture and working of Convolutional Neural Networks (CNNs) and their applications in computer vision tasks.
2. How an unsupervised neural network is trained, explain in details with example?
3. Compare AlexNet and ResNet architectures in terms of design principles and performance on image recognition benchmarks.
4. Propose a deep learning pipeline for speech recognition, detailing each step from pre-processing to LSTM model evaluation.
5. Discuss Autoencoders, their types and applications in anomaly detection task with examples.

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B.Tech. VIII Sem. (Main/Back) Examination, April/May - 2025

Open Elective-II

8AG6 - 60.1 Energy Management

Time : 3 Hours **Maximum Marks : 70**

Instructions to Candidates:

Attempt all Ten questions from Part A, Five questions out of seven questions from Part B and Three questions out of five questions from Part C.

Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly. Units of quantities used/calculated must be stated clearly.

Use of following supporting material is permitted during examination. (Mentioned in form No. 205).

PART - A

(Answer should be given up to 25 words only)

All questions are compulsory. **(10×2=20)**

1. Define Energy.
2. What is Energy Management?
3. What do you mean by Commercial Energy?
4. Explain Energy Integration.
5. Energy Audit.
6. Discuss energy resources.
7. What are different energy sectors?
8. Describe energy pricing.
9. Write about LOW Grade Energy.
10. Explain Rinewable Energy.

PART - B
(Analytical / Problem Solving Questions)

Attempt any Five questions. **(5×4=20)**

1. List the primary and secondary energy sources. Also discuss the energy scenario of India.
2. Define energy conservation, mention its importance and describe energy conservation Act - 2001.
3. List the key instruments for energy audit and explain its functions.
4. Explain in detail about "Concept of Green Buildings".
5. Discuss the Cleaner energy sources.
6. Describe the energy demand management.
7. Explain energy forecasting techniques.

PART - C
(Descriptive / Analytical / Problem Solving / Design Questions)

Attempt any Three questions. **(3×10=30)**

1. Explain different types of energy audit. Discuss in detail of about all three phases of energy audit.
2. Write an essay on "Energy for sustainable Development".
3. Explain different sources of Renewable energy also give its applications in different sectors.
4. Discuss the importance of energy Management Information system (EMIS) to implement an Energy Management Programme.
5. How the energy conservation can be made in the refrigeration and air condition based systems? Discuss in detail.