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8E1909

Roll No. _____

Total No. of Pages: **2****8E1909****B. Tech. VIII-Sem. (Main/Back) Exam. April-2026****Computer Science & Engineering****(Artificial Intelligence)/(Regional Language)****8CAI4/CSR4/CS4-01 Big Data Analytics****CS, CAI, CSR****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)

1. NIL2. NIL**PART – A****[10×2=20]****(Answer should be given up to 25 words only)****All questions are compulsory**

- Q.1 Define Big Data and list the traditional “3Vs”.
- Q.2 What is Big Data Analytics?
- Q.3 List out the sources of Big Data.
- Q.4 What is the role of Namenode and Datanode in Hadoop?
- Q.5 Why is a Combiner used in MapReduce?
- Q.6 What is Pig Latin?
- Q.7 Name two Hadoop configuration XML files.
- Q.8 What is Hive used for? Name any two Hive data types.
- Q.9 What is structured data, unstructured data and semi-structured data?
- Q.10 Write any two difference between Pig Latin and SQL.

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PART – B

[5×4=20]

(Analytical/Problem solving questions)

Attempt any five questions

- Q.1 Explain the major features and challenges of Big Data.
- Q.2 Describe the problems with traditional large-scale systems.
- Q.3 Explain the three modes of Hadoop cluster configuration (Local, Pseudo-distributed, Fully Distributed)
- Q.4 Discuss the Writable Interface and types of Writable Classes.
- Q.5 Analyze the impact of Big Data technologies (Hadoop, Pig, Hive) on data analytics.
- Q.6 Describe the building blocks of Hadoop (Namenode, Datanode, Secondary Namenode, Job Tracker, Task Tracker).
- Q.7 Discuss the difference between Local, Pseudo-distributed and Fully Distributed Hadoop cluster modes.

PART – C

[3×10=30]

(Descriptive/Analytical/Problem Solving/Design Questions)

Attempt any three questions

- Q.1 Discuss the Hadoop Distributed File System (HDFS) architecture with diagrams.
- Q.2 Explain Pig Architecture, Pig Latin flow and Pig Script Interfaces in detail.
- Q.3 Explain the process of creating and managing databases and tables in Hive.
- Q.4 Discuss the advantages of Pig over traditional MapReduce programming. Also explain how Pig simplifies Hadoop programming with examples.
- Q.5 Analyze how implementing a Custom Writable and using a Raw Comparator together can improve Hadoop performance, particularly in terms of speed and efficiency of data processing.



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8E1961

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Total No. of Pages: **4****8E1961**

B. Tech. VIII-Sem. (Main/Back) Exam. April-2026
Computer Science & Engineering (Data Science)
Artificial Intelligence and Data Science
8AID4/8CDS4-01 Deep Learning and Its Applications
AID & CDS

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)*

1. NIL _____2. NIL _____**PART – A****[10×2=20]****(Answer should be given up to 25 words only)****All questions are compulsory**

Q.1 State the objective and scope of Deep Learning.

Q.2 Define Maximum Likelihood Estimation.

Q.3 What is Multilayer Perceptron (MLP)?

Q.4 Define Representation Learning.

Q.5 What is ReLU activation function?

- Q.6 What is parameter sharing in CNN?
- Q.7 Define Recurrent Neural Network (RNN).
- Q.8 What is Backpropagation Through Time (BPTT)?
- Q.9 What is an Undercomplete Autoencoder?
- Q.10 Define Contractive Autoencoder.

PART – B

[5×4=20]

(Analytical/Problem solving questions)

Attempt any five questions

- Q.1 Explain the objectives, scope and expected outcomes of the Deep Learning course.
- Q.2 Describe the steps involved in building a Machine Learning Algorithm. Explain Stochastic Gradient Descent and Curse of Dimensionality.
- Q.3 Differentiate between Machine Learning and Deep Learning. Discuss width and depth of neural networks with suitable examples.
- Q.4 Explain the architecture of Convolutional Neural Networks. Discuss layers, filters, parameter sharing and regularization.
- Q.5 Explain Encoder-Decoder sequence-to-sequence architecture. Describe the training of RNN using BPTT.
- Q.6 Explain Regularized and Stochastic Autoencoders with suitable diagrams.
- Q.7 Discuss Deep Learning applications in Computer Vision, Speech Recognition and Natural Language Processing with case studies in classification and regression.

PART – C

[3×10=30]

(Descriptive/Analytical/Problem solving/Design questions)

Attempt any three questions

- Q.1 Explain Deep Feed Forward Networks in detail. Discuss Backpropagation algorithm and its variants with mathematical formulation.
- Q.2 Explain activation functions such as ReU, Leaky ReLU and ELU. Discuss Unsupervised Training and Restricted Boltzmann Machines in deep architectures.
- Q.3 Explain Convolutional Neural Networks in detail. Discuss popular architectures such as AlexNet and ResNet with their applications.
- Q.4 Explain Recurrent Neural Networks and Long Short-Term Memory (LSTM) networks. Discuss Bidirectional RNNs with suitable diagrams and applications.
- Q.5 What are Autoencoders? Explain undercomplete, regularized and contractive Autoencoders. Discuss their role in representation learning.
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B. Tech. VIII-Sem. (Main/Back) Exam. April-2026

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)*1. NIL2. NIL**PART – A****[10×2=20]****(Answer should be given up to 25 words only)****All questions are compulsory**

- Q.1 Define Energy Auditing.
Q.2 What is the significance of the "Energy Matrix" in industries?
Q.3 Define "Payback Period" in energy projects.
Q.4 What are "Green Buildings"?
Q.5 What is the "Energy Conservation Act 2001"?
Q.6 Name two energy forecasting models.
Q.7 Define Energy Efficiency.
Q.8 What is the main goal of Energy Demand Management?
Q.9 What do you understand by Energy Integration?
Q.10 What is meant by Energy Forecasting?

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PART – B

[5×4=20]

(Analytical/Problem solving questions)

Attempt any five questions

- Q.1 What are the different types of energy auditing tools? Explain their specific uses in detail.
- Q.2 Explain the conceptual and practical differences between energy auditing and energy forecasting.
- Q.3 What is meant by Energy Accounting? Provide a step-by-step procedure for implementing it.
- Q.4 Discuss various practical ways to implement energy conservation in rural areas.
- Q.5 Explain the concept of "Energy Security" and its components.
- Q.6 Describe the various steps involved in a Preliminary Energy Audit.
- Q.7 Describe the various energy-saving measures available for the transport sector.

PART – C

[3×10=30]

(Descriptive/Analytical/Problem Solving/Design Questions)

Attempt any three questions

- Q.1 Describe in detail the current pattern of energy consumption in Indian agriculture and the major constraints in production.
- Q.2 Discuss various energy-saving measures that can be implemented in modern commercial and residential buildings.
- Q.3 Explain the detailed methodology of a Comprehensive Energy Audit for a manufacturing plant.
- Q.4 Detail the "Energy Matrix" approach for a textile industry to identify energy-saving opportunities.
- Q.5 Explain the importance and procedure of "Energy Monitoring and Targeting (M&T)" in a process industry.



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B. Tech. VIII-Sem. (Main/Back) Exam. April-2026

Information Technology

8IT4-01 Internet of Things (IoT)

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)*

1. NIL2. NIL**PART - A****[10×2=20]****(Answer should be given up to 25 words only)****All questions are compulsory**

- Q.1 Define IoT in simple terms.
- Q.2 What is meant by “smart devices” in IoT?
- Q.3 What is the difference between a sensor and an actuator?
- Q.4 Name two IoT enabling technologies.
- Q.5 What is REST in IoT architecture?
- Q.6 What is smart home?
- Q.7 What is the role of URIs in IoT?

- Q.8 Mention two IoT operating systems.
- Q.9 Mention one similarity and one difference between IoT and M2M.
- Q.10 Write any two IoT applications in agriculture.

PART – B

[5×4=20]

(Analytical/Problem solving questions)

Attempt any five questions

- Q.1 Explain the characteristics of IoT in detail.
- Q.2 Discuss challenges in IoT implementation.
- Q.3 What do you mean by “things” in IoT? Explain.
- Q.4 What are the 4 key pillars of IoT? Explain.
- Q.5 Explain SDN and NFV and their role in IoT.
- Q.6 Analyze which is better for IoT projects: Arduino or Raspberry Pi.
- Q.7 Discuss the role of cloud services in IoT, with examples of public and private cloud solutions.

PART – C

[3×10=30]

(Descriptive/Analytical/Problem Solving/Design Questions)

Attempt any three questions

- Q.1 Discuss different components of an IoT architecture and explain how they interact within an IoT ecosystem.
- Q.2 Discuss challenges in IoT including security, design and development.
- Q.3 Discuss IoT applications in multiple domains like energy, retail, logistics and healthcare.
- Q.4 Write short notes on the following -
(i) IoT Enabling Technologies
(ii) Security threats in IoT
- Q.5 Write short note on the following -
(i) Different types of IoT sensors
(ii) Evolution from M2M to IoT
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B. Tech. VIII - Sem. (Old Back) Exam. April - 2026

Information Technology

8IT4-01 Internet of Things

Time: 3 Hours

Maximum Marks: 120

Min. Passing Marks: 42

Instructions to Candidates:

Attempt all ten questions from Part A, five questions out of seven questions from Part B and four 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)

1. NIL

2. NIL

PART – A

[10×2=20]

(Answer should be given up to 25 words only)

All questions are compulsory

- Q.1 Define Internet of Things (IoT).
- Q.2 What is a Sensor?
- Q.3 Give one example of an IoT application.
- Q.4 What is a Communication Model in IoT?
- Q.5 Define actuator.
- Q.6 What is Arduino?
- Q.7 What is REST architecture?
- Q.8 What is M2M communication?
- Q.9 What is cloud computing in IoT?
- Q.10 Define Big Data analytics.

PART – B

[5×8=40]

(Analytical/Problem solving questions)

Attempt any five questions

- Q.1 Describe the physical and logical design of IoT.
- Q.2 Discuss IoT enabling technologies.
- Q.3 Explain the working of temperature and humidity sensors.
- Q.4 Describe Raspberry Pi and its role in IoT.
- Q.5 Explain IoT architecture and reference model.
- Q.6 Discuss design and security challenges in IoT.
- Q.7 Differentiate between IoT and M2M communication.

PART – C

[4×15=60]

(Descriptive/Analytical/Problem Solving/Design Questions)

Attempt any four questions

- Q.1 (a) Design an IoT-based smart agriculture system including sensors, actuators, and communication model. [8]
(b) Analyze challenges (connectivity, cost, security) and propose suitable solutions. [7]
 - Q.2 (a) Explain IoT reference model and architecture in detail. [8]
(b) Critically evaluate how it supports scalability and large-scale deployment. [7]
 - Q.3 (a) Describe IoT implementation in traffic and energy management systems. [8]
(b) Analyze data handling strategies and security concerns in such systems. [7]
 - Q.4 (a) Explain SDN and NFV concepts with respect to IoT. [8]
(b) Compare their roles in improving network efficiency and flexibility. [7]
 - Q.5 (a) Design an IoT-based home automation system with architecture and components. [8]
(b) Analyze limitations and suggest improvements. [7]
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B. Tech. VIII-Sem. (Main/Back) Exam. April-2026

Open Elective-II

8AG6-60.1 Energy Management

Time: 3 Hours

Maximum Marks: 70

Instructions to Candidates:

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1. NIL2. NIL

[10×2=20]

PART – A**(Answer should be given up to 25 words only)****All questions are compulsory**

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Q.8 What is the main goal of Energy Demand Management?
Q.9 What do you understand by Energy Integration?
Q.10 What is meant by Energy Forecasting?

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PART – B

[5×4=20]

(Analytical/Problem solving questions)

Attempt any five questions

- Q.1 What are the different types of energy auditing tools? Explain their specific uses in detail.
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- Q.7 Describe the various energy-saving measures available for the transport sector.

PART – C

[3×10=30]

(Descriptive/Analytical/Problem Solving/Design Questions)

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- Q.5 Explain the importance and procedure of "Energy Monitoring and Targeting (M&T)" in a process industry.