

Term End Examination January – 2026

Date : 16/02/2026
Time : 03:00am to 05:15pm
Duration : 02.15 Hours
Max. Marks : 70

Section A

Answer the following (Attempt any three)

(30)

1. Describe the Data Science lifecycle in detail and explain how Artificial Intelligence enhances each stage of the lifecycle.
2. Explain data cleaning, transformation, and normalization techniques. Discuss methods for handling missing data and outliers with examples.
3. Explain regression analysis in supervised learning. Discuss linear and multiple regression models along with their assumptions and applications.
4. Explain dimensionality reduction techniques. Discuss Principal Component Analysis and its importance in data preprocessing.
5. Explain knowledge representation in AI. Discuss different methods such as semantic networks, frames, and logic-based representation.

Section B

Answer the following (Attempt any four)

(20)

1. Differentiate between Artificial Intelligence, Machine Learning, and Deep Learning with suitable examples.
2. What is backpropagation? Explain its role in training neural networks.
3. Differentiate between regression and classification with examples.
4. What is clustering? Explain its applications in real-world scenarios.
5. What is a rational agent? Explain its characteristics.
6. Explain in brief about generative models in AI.

Section C

Part – A (Multiple Choice Questions)

(10)

- Which event is considered the formal birth of Artificial Intelligence as a field of study?
A Turing Test
B Development of ELIZA
C Dartmouth Conference
D AI Winter
- Explainable AI (XAI) mainly focuses on:
A Making AI decisions transparent
B Increasing model complexity
C Improving hardware efficiency
D Replacing human intelligence
- GAN consists of which two competing neural networks?
A Encoder and Decoder
B Generator and Discriminator
C Actor and Critic
D Input and Output layers
- Which NLP task determines whether a text expresses positive, negative, or neutral emotion?
A Tokenization
B Parsing
C Machine Translation
D Sentiment Analysis
- Which algorithm is used to update weights in a neural network?
A Backpropagation
B Clustering
C Forward propagation
D Gradient boosting

- 6 Which search algorithm uses both path cost and heuristic information?
A BFS B DFS
C A* Search D Depth-Limited Search
- 7 Which knowledge representation technique uses nodes and links to represent relationships?
A Frames B Semantic Networks
C Predicate Logic D Decision Trees
- 8 An agent that always acts to achieve the best expected outcome is called a:
A Simple agent B Learning agent
C Reflex agent D Rational agent
- 9 Which technique is widely used for dimensionality reduction in machine learning?
A PCA B SVM
C K-Means D Naive Bayes
- 10 Which algorithm partitions data into K predefined clusters?
A Hierarchical Clustering B DBSCAN
C K-Means D Decision Tree

Part – B (Do as Directed)

(10)

State whether the following statements are true or false

- 1 Explainable AI aims to improve trust by making AI model decisions understandable to humans.
- 2 Tokenization is the process of converting text into numerical vectors directly.
- 3 Activation functions introduce non-linearity into neural networks.
- 4 Heuristic functions are used to guide informed search algorithms toward optimal solutions.
- 5 Clustering requires labeled data to group similar data points.
- 6 Regression models are primarily used to predict categorical outcomes.
- 7 Reinforcement learning learns through interaction with an environment using rewards and penalties.
- 8 Data Science involves only data visualization and does not include model building or deployment.
- 9 AI winters occurred due to limited computational power and unrealistic expectations from early AI systems.
- 10 Normalization is used to scale numerical data into a standard range to improve model performance.
