B.K. BIRLA CENTRE FOR EDUCATION

SARALA BIRLA GROUP OF SCHOOLS
A CBSE DAY-CUM-BOYS' RESIDENTIAL SCHOOL

POST-MID TERM 2025-26

ARTIFICIAL INTELLIGENCE – MARKING SCHEME (843)

Class : XI SCIENCE/COMMERCE/ARTS **Duration : 1 Hr**
Date : 10-01-2026 **Max. Marks : 25**
Admission No.: **Roll No.:**

General Instructions:

Try to attempt all questions as per given order.

All questions are compulsory.

The Question Paper is divided into Three sections Section A to C.

- Section A has 10 questions attempt only 7 and carry 1 mark each.
- Section B has 10 questions attempt only 6 and carry 2 marks each.
- Section C has 5 questions attempt only 2 and carry 3 marks each.

Section-A

1. What is the primary reason for mitigating bias in Al systems? 1
   a. To amplify existing problems b. To reinforce societal inequalities
   c. To enhance trust and reliability * d. To perpetuate systemic discrimination

2. Which of the following is NOT one of the core principles of Al ethics? 1
   a. Fairness b. Explainability c. Cost-effectiveness * d. Privacy

3. What is the primary cause of facial recognition algorithms having difficulty identifying people with darker complexions? 1
   a. Poor camera quality b. Lack of diverse training data *
   c. Over-representation of older faces d. Use of outdated algorithms

4. What does bias in Al typically reflect? 1
   a. Technological advancements b. Social prejudices about race, gender, age, and culture *
   c. Random data anomalies d. Errors in coding

5. What is meant by bias awareness in the context of Al? 1
   a. Understanding that Al systems can show unfair preferences *
   b. Ensuring Al systems are technologically advanced
   c. Using only the latest Al algorithms
   d. Avoiding the use of Al in sensitive areas

6. Reinforcement learning is based on 1
   a. Learning from labelled data b. Learning through observation
   c. The trial and error method * d. Dimensionality reduction

7. Which of the following is used when a situation might belong to more than one class at the same time? 1
a. Multi-label classification * b. Binary classification
c. Multi-class classification d. Imbalanced classification

8. Which of the following is true about residual error? 1
a. lower value is better * b. higher value is better
c. Either a. or b. d. All of these

9. Which of the following is NOT typically a use case for regression analysis? 1
a. Weather forecasting
b. Finding the causal-effect relationship between variables
c. Time series modelling
d. Grouping data into specified categories *

10. Which of the following is NOT an application of linear regression? 1
a. Predicting the effect of fertiliser on crop yield
b. Managing risks and portfolio optimisation
c. Classifying images of handwritten digits *
d. Predicting salary based on years of experience

SECTION - B

11 What is AI bias? 2
Ans: **AI Bias** is an **unfair or incorrect decision made by an AI system** because it learned from data that was incomplete, incorrect, or unbalanced.
Example: If an AI is trained mostly on data about adults, it may not work well for children.

12 Explain the term Bias Awarness. 2
Ans: **Bias Awareness** means **understanding that biases exist** in ourselves, in society, and in AI systems.
It helps us recognize unfair patterns and work to reduce them while using or creating AI.

13 Write the five pillars of AI Ethics. 2
Ans:
The five pillars of AI Ethics are:
Fairness – AI should treat everyone equally.
Accountability – Humans should take responsibility for AI decisions.
Transparency – AI systems should be understandable.
Safety & Security – AI should not harm people or data.
Privacy & Protection – Personal data must remain safe.

14 What is Ethical Dilemma? 2
Ans: An **ethical dilemma** is a **situation where a person must choose between two right choices**, or where the right choice is difficult to decide because both sides have pros and cons.
Example: Choosing between saving the environment or building a factory that gives jobs.

15 What is Machine learning? 2
Ans: **Machine Learning (ML)** is a branch of AI where **computers learn from data** and improve their performance without being directly programmed.
Example: A computer learning to recognize handwriting by studying many examples.

16 What is Reinforcement learning? 2
Ans: **Reinforcement Learning (RL)** is a type of machine learning where an **agent learns by interacting with the environment**, receiving **rewards for good actions** and **penalties for bad actions**.
Example: A robot learning to walk by trying different movements and getting rewarded for

17 Write two disadvantages of Linear Regression. 2

Ans: It **assumes a straight-line (linear) relationship** between variables, which may not always be true.

 It is **sensitive to outliers** (unusual data points), which can distort the results.

18 What is Correlation? 2

Ans: Correlation is a statistical measure that shows how strongly two variables are related to each other.

Example: Height and weight usually have a positive correlation.

19 Write two disadvantages of Supervised learning.

Ans: It needs **large amounts of labeled data**, which is time-consuming and expensive to prepare.

 It may **overfit**, meaning it performs well on training data but poorly on new data.

20 Define dependent and independent variables.

Ans: **Dependent Variable:** The outcome or result that we want to predict or study.

 Independent Variable: The factor or input that influences or causes changes in the dependent variable.

SECTION – C

21 Explain any three applications of Clustering. 3

Ans: a) Customer Segmentation

Businesses use clustering to **group customers** based on buying habits, age, or preferences.

Example: Online shopping apps group customers to show personalized ads or offers.

b) Image Segmentation

Clustering helps **divide an image into meaningful parts**, such as separating background from objects.

Example: In medical scans, it helps identify tumors or organs.

c) Anomaly Detection

Clustering helps find **unusual or abnormal patterns**.

Example: Banks detect fraud by spotting unusual transactions that do not fit any cluster.

22 Explain Classification process in detail. 3

Ans: **Classification** is a machine learning process used to **predict categories or labels**.

The steps involved are:

1. **Data Collection**
   Gather data (e.g., images, text, numbers) to train the model.
2. **Data Preprocessing**
   Clean the data by removing errors, filling missing values, and converting text into numbers.
3. **Feature Selection/Extraction**
   Identify important characteristics (features) that help the model make decisions.
4. **Model Training**
   A classification algorithm (e.g., Decision Tree, SVM, Logistic Regression) learns patterns from labeled data.
5. **Model Testing**
   The model is tested with new, unseen data to check accuracy.
6. **Prediction**
   After training, the model predicts the class label for new input data.
   Example: Predicting whether an email is **spam** or **not spam**.

23 Differentiate between binary and multiclass classification. 3

Ans:

Binary Classification	Multiclass Classification
Has **two** possible output classes.	Has **more than two** output classes.
Example: "Spam" or "Not Spam."	Example: Classifying fruits as **apple**, **banana**, **mango**.
Simpler to train.	More complex because of multiple categories.
Uses algorithms like Logistic Regression, SVM, etc.	Uses algorithms like Decision Tree, Random Forest, etc.

24 Explain any three strategies for mitigating bias. 3

Ans: a) Using Diverse and Balanced Data
Collect data from different groups, genders, ages, regions, etc., so the model learns fairly.
b) Regular Bias Testing
Run tests on AI models to check if they are treating all groups equally.
Example: Checking if a hiring AI favors one gender over another.
c) Human Review and Oversight
Involve humans to monitor AI decisions, especially in sensitive areas.
Humans can catch unfair patterns that AI might miss.

25 Explain any three reason why AI ethics is important. 3

Ans: a) Prevents Discrimination
AI ethics ensures that AI systems do not treat people unfairly based on gender, age, race, or background.
b) Builds Trust
When AI is transparent, safe, and fair, people trust it more—important for healthcare, education, and government.
c) Protects Privacy
AI ethics ensures that personal data is collected and used responsibly, preventing misuse and data leaks.