CENTRAL BOARD OF SECONDARY EDUCATION

CBSE 2026-27

Artificial Intelligence

Subject Code: 417 | Class X

Marking Scheme – Sample Question Paper – Set 5

Time Allowed: 2 Hours **Maximum Marks: 50**

General Instructions

1. This marking scheme gives the value points and the mark split only; the questions are in Sample Question Paper Set 5.
2. Answers to questions numbered 1 to 5 are given sub-part wise (i)–(vi); a candidate answers any 4/any 5 of them as instructed in the paper.
3. Any other relevant answer, correctly written, should be given due credit.
4. Marks may be awarded for any correct part of a value point, as per the split shown.

Exam Pattern

Section	Type of Questions	No. of Qs	Marks each	Total Marks
A	Q1: Objective (MCQ) – Employability Skills (answer any 4 of 6)	6 (any 4)	1	4
A	Q2–Q5: Objective (MCQ / Assertion–Reason / fill-in / one-word) – Subject Specific Skills (answer any 5 of 6 in each)	24 (any 20)	1	20
B	Q6–Q10: Short Answer (20–30 words) – Employability Skills (answer any 3 of 5)	5 (any 3)	2	6
B	Q11–Q16: Short Answer (20–30 words) – Subject Specific Skills (answer any 4 of 6)	6 (any 4)	2	8
B	Q17–Q21: Long Answer / Case-based (50–80 words) – Subject Specific Skills (answer any 3 of 5)	5 (any 3)	4	12
	Total	**46 items in 21 Qs (any 34)**		**50**

Unit-wise Weightage of Marks

Unit	Unit Name	Chapter	Marks
A-1	Communication Skills – II	Ch. 1	2
A-2	Self-Management Skills – II	Ch. 2	2
A-3	ICT Skills – II	Ch. 3	2
A-4	Entrepreneurial Skills – II	Ch. 4	2
A-5	Green Skills – II	Ch. 5	2
B-1	Revisiting AI Project Cycle & Ethical Frameworks for AI	AI project cycle; AI domains; ethical frameworks; bioethics	7
B-2	Advanced Concepts of Modeling in AI	AI vs ML vs DL; rule/learning based; supervised, unsupervised, reinforcement; ANN/CNN; neural networks	11

Unit	Unit Name	Chapter	Marks
B-3	Evaluating Models	Evaluation; train-test split; accuracy & error; confusion matrix; precision, recall, F1; ethics	10
B-4	Statistical Data	Assessed through practicals only	–
B-5	Computer Vision	CV applications & tasks; pixels, resolution, grayscale & RGB images	4
B-6	Natural Language Processing	Applications; stages of NLP; chatbots; text normalisation; BoW; TF-IDF	8
B-7	Advance Python	Assessed through practicals only	–
	Total		**50**

Answers only. Section A answers are given sub-part wise (i)–(vi): a candidate attempts any 4 sub-parts of Q1 and any 5 of each of Q2–Q5, as instructed in the paper. Section B: any 3 of Q6–Q10, any 4 of Q11–Q16, any 3 of Q17–Q21.

SECTION – A

Answers to Objective Type Questions (24 marks)

Q1. [4]

(i) (c) Gesture – Gestures are hand and arm movements used to communicate. [1]
(ii) (b) Your work is nice. – It is vague and does not say what to keep or change. [1]
(iii) (b) Responsibility [1]
(iv) (c) Weekly maintenance [1]
(v) (b) Patience [1]
(vi) (a) Using solar energy [1]

Q2. [5]

(i) (c) Maximise processing speed – The four principles are respect for autonomy, do not harm, ensure maximum benefit, and give justice. [1]
(ii) (c) Three – The three domains are Statistical Data (Data Sciences), Computer Vision and Natural Language Processing. [1]
(iii) (a) It receives and passes the raw input data to the hidden layers. [1]
(iv) (b) It may lead to overfitting and give an overly optimistic accuracy [1]
(v) (d) 1,049,088 [1]
(vi) (c) Semantic analysis [1]

Q3. [5]

(i) Problem Scoping [1]
(ii) (a) A weighted sum of the inputs plus a bias [1]
(iii) (c) Accuracy [1]
(iv) (a) Both A and R are correct, and R is the correct explanation of A. [1]
(v) (d) A is incorrect, but R is correct. [1]
(vi) (b) The stop word 'the' that occurs frequently in every document [1]

Q4. [5]

(i) (c) Step-by-step guidance – Frameworks are a set of steps that give step-by-step guidance for solving problems in an organised manner. [1]
(ii) Bias [1]
(iii) A case that is actually positive and is correctly predicted as positive by the model. [1]
(iv) Underfitting [1]
(v) (a) combine extracted features and produce the final class output [1]
(vi) Stemming [1]

Q5. [5]

(i) (d) Intuition and Values – Culture, religion, intuition and values, and the value we give to humans and non-humans knowingly or unknowingly influence our decisions. [1]
(ii) (c) Identifying whether a loan applicant will default (Yes/No) [1]
(iii) (a) Recall [1]
(iv) (a) It enhances or transforms an image, such as changing brightness or rescaling [1]
(v) (a) Both A and R are correct, and R is the correct explanation of A. [1]
(vi) (c) The order of tokens does not matter [1]

SECTION – B

Answers to Subjective Type Questions (26 marks)

Q6. [2]

Use clear, simple and concise language [1]
Listen actively and encourage feedback [1]

Q7. **[2]**

Follow a fixed study timetable and avoid distractions such as the phone [1]
Stay calm, take short breaks and control anxiety through deep breathing [1]

Q8. **[2]**

Clean the keyboard [1]
Clean the monitor, dust the CPU or printer, or back up data to an external drive [1]

Q9. **[2]**

Wage-employed people work for a person or organisation and are paid for the work [1]
Self-employed people start their own businesses to satisfy the needs of people [1]

Q10. **[2]**

Clean water and sanitation [1]
Life below water [1]

Q11. **[2]**

Problem Scoping, Data Acquisition, Data Exploration [1]
Modelling, Evaluation, Deployment [1]

Q12. **[2]**

A neural network is a system of interconnected nodes arranged in layers that process data. [1]
Like neurons in the brain, its nodes receive signals, process them and pass the result on to other nodes. [1]

Q13. **[2]**

Features are the input attributes used to make a prediction, for example Attendance and Study hours. [1]
A label is the output or target value the model must predict, for example Pass or Fail. [1]

Q14. **[2]**

Recall is preferred in cancer screening, where missing a patient who has the disease (False Negative) is very harmful.[1]
Precision is preferred in spam filtering, where wrongly marking an important email as spam (False Positive) is costly.[1]

Q15. **[2]**

ReLU is an activation function, defined as max(0, x). [1]
It replaces all negative values in the feature map with zero, adding non-linearity. [1]

Q16. **[2]**

Stage: Syntactic analysis (parsing), which checks the grammar of sentences and phrases. [1]
The first sentence is grammatically wrong and is rejected; the second forms a valid relationship among words. [1]

Q17. **[4]**

The AI project cycle is the cyclical process followed to complete an AI project; it provides an appropriate framework (structure and order) that leads us towards the goal, with each stage building on the previous one. [1]
Data Acquisition: we collect data from various reliable and authentic sources; this data becomes the base of the project.[1]
Data Exploration: we give the acquired data a visual representation using graphs, databases, flow charts, maps, etc. [1]
Difference: acquisition gathers the raw data, while exploration studies/visualises the already collected data to interpret patterns and decide the model. [1]

Q18. **[4]**

Classification uses labelled data to assign items to predefined categories; example: sorting emails as spam or not spam. [1]
Clustering uses unlabelled data to form groups of similar items; example: grouping customers by purchase behaviour. [1]
Classification is supervised learning, while clustering is unsupervised learning. [1]
In classification the categories are known in advance; in clustering the groups are discovered by the model. [1]

Q19. **[4]**

Regression predicts a continuous numerical value; example: predicting next month's sales in Rs. [1]
Classification assigns a discrete category; example: predicting whether a customer will buy (Yes/No). [1]
A regression output can take any value in a range, while a classification output is one of fixed classes. [1]
Both are supervised learning models trained on labelled data. [1]

Q20. **[4]**

The dataset is divided into training and testing subsets (for example, in an 80:20 ratio). [1]
The model is trained only on the training data so that it learns the patterns. [1]
The trained model predicts outcomes for the testing data, and its predictions are compared with the actual values. [1]
Unseen testing data shows how the model will perform on new real-world data; testing on training data would give an overly optimistic result. [1]

Q21. **[4]**

Lexical analysis splits text into paragraphs, sentences and words; syntactic analysis checks grammar (e.g. it rejects 'Going the zoo we tomorrow'). [1]
Semantic analysis checks meaning (e.g. it rejects 'hot ice cream'); discourse integration checks the link between sentences (e.g. 'He was ill. So he missed school.'). [1]
Pragmatic analysis finds the intended meaning in the real world (e.g. 'Can you open the window?' is read as a request). [1]
Together, the stages move from raw text to a meaningful and understood message. [1]

***** END OF PAPER *****