CENTRAL BOARD OF SECONDARY EDUCATION

CBSE 2026-27

Artificial Intelligence

Subject Code: 417 | Class X

Marking Scheme – Sample Question Paper – Set 8

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 8.
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) (d) Clarity of message [1]
(ii) (c) Improves concentration and calms the mind [1]
(iii) (c) Cleans or removes it [1]
(iv) (a) Self-confidence [1]
(v) (a) When people buy and sell, everyone involved makes money [1]
(vi) (b) Earthworms [1]

Q2. [5]

(i) (a) Both A and R are correct, and R is the correct explanation of A. [1]
(ii) Respect for autonomy; Do not harm; Ensure maximum benefit for all; Give justice [1]
(iii) (b) It is a subset of machine learning that uses multi-layer neural networks. [1]
(iv) False Positive [1]
(v) Image segmentation [1]
(vi) 4 [1]

Q3. [5]

(i) (b) Irrespective of people's background, in a justified manner – Justice requires that all benefits and burdens be distributed in a justified manner across people irrespective of background. [1]
(ii) Testing [1]
(iii) (a) Train-test split [1]
(iv) (a) Statement 1 is correct but statement 2 is incorrect. [1]
(v) (c) Camera or image sensor [1]
(vi) (d) Smart bot [1]

Q4. [5]

(i) (c) Natural Language Processing – Email/spam filters are one of the most basic applications of NLP online. [1]
(ii) (c) Human brain [1]
(iii) (b) Both A and R are correct, but R is not the correct explanation of A. [1]
(iv) (a) When a spam email is mistakenly identified as legitimate. [1]
(v) (d) Computer Vision [1]
(vi) (d) Language translation [1]

Q5. [5]

(i) (a) Know how the algorithm functions, with reproducible and accessible training data – Respect for autonomy means enabling users to be fully aware of the decision-making, with accessible data and released predictions when concerns arise. [1]
(ii) (a) Both A and R are correct, and R is the correct explanation of A. [1]
(iii) (b) False Negative (failing to detect actual danger) [1]
(iv) (d) Google Translate app [1]
(v) (b) An AI assistant that learns from conversations and answers new questions [1]
(vi) (a) Keyword extraction [1]

SECTION – B

Answers to Subjective Type Questions (26 marks)

Q6. [2]

Descriptive feedback describes observed behaviour specifically and without judgement [1]
E.g. 'The report lacks data in section 2; adding survey figures would strengthen it' [1]

Q7. **[2]**

Meditation calms the mind and reduces anxiety through focused breathing or attention [1]
It improves concentration and emotional balance, so one responds calmly to stress [1]

Q8. **[2]**

They use hard-disk space and slow down the computer [1]
Removing them with disk-cleaner software improves performance [1]

Q9. **[2]**

Capital is the money used to start a business [1]
It pays for materials, rent and salaries before the business earns income [1]

Q10. **[2]**

Development that satisfies the needs of the present without compromising the capacity of future generations [1]
It balances economic growth, care for the environment and social well-being [1]

Q11. **[2]**

Bioethics is an ethical framework used in healthcare and life sciences dealing with ethical issues related to health, medicine and biological sciences. [1]
Principles: respect for autonomy, do not harm, ensure maximum benefit for all, give justice. [1]

Q12. **[2]**

Its output is a discrete category or class label, such as Spam or Not Spam. [1]
It is a supervised learning model trained on labelled data. [1]

Q13. **[2]**

Classification assigns data to predefined categories or class labels. [1]
Example: identifying whether an email is spam or not spam. [1]

Q14. **[2]**

Transparency means clearly reporting how the model was tested, the data used, the metrics and the limitations of the model. [1]
This lets users and experts verify fairness and trust the model's results. [1]

Q15. **[2]**

The user uploads a photo, and the system analyses its visual features such as shapes, colours and patterns. [1]
It then matches these features with images on the web and returns similar images and related information. [1]

Q16. **[2]**

Human (natural) language is complex, redundant, context-dependent and changes over time. [1]
Computer language (such as Python or C++) is formal and precise, with fixed syntax that the computer follows exactly. [1]

Q17. **[4]**

Sector-based frameworks: tailored to specific sectors or industries, e.g., Bioethics for healthcare, which addresses patient privacy, data security and ethical use of AI in medical decision-making. [1]
Value-based frameworks: focus on fundamental ethical principles and values guiding decision-making, reflecting moral philosophies. [1]
Their three categories: rights-based (protecting human rights and dignity), utility-based (maximising overall good for the greatest number), virtue-based (character and intentions of decision-makers). [1]

Example application: e.g., a rights-based lens would reject an AI system that discriminates against a group. [1]

Q18. **[4]**

Input layer receives the data and passes it on without processing. [1]
Hidden layers perform the processing at each node. [1]
Output layer gives the final result to the user. [1]
Weights show the strength of connections, and biases shift the weighted sum. [1]

Q19. **[4]**

Clustering groups similar data points together without predefined labels; example: grouping customers by buying habits. [1]
Association finds items or variables that frequently occur together in large datasets; example: market basket analysis. [1]
Both work on unlabelled data. [1]
Clustering finds groups of similar items; association finds rules about what occurs together. [1]

Q20. **[4]**

(i) True Negatives = 970. [1]
(ii) Accuracy = (15 + 970) / 1000 = 0.985 (98.5%). [1]
(iii) Precision = 15 / (15 + 10) = 0.6. [1]
(iv) Recall (= 15 / (15 + 5) = 0.75) should be prioritised, because missing a fraud (FN) is costlier; the high accuracy is misleading as most transactions are genuine. [1]

Q21. **[4]**

(i) [the, phone, is, great]; stop words are not removed in this step. [1]
(ii) 'was', 'and', 'the' and 'were'. [1]
(iii) So that the machine treats 'GREAT' and 'great' as the same word and does not count them separately. [1]
(iv) 5 tokens: Battery, life, is, poor and the full stop. [1]

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