CENTRAL BOARD OF SECONDARY EDUCATION

CBSE 2026-27

Artificial Intelligence

Subject Code: 417 | Class X

Marking Scheme – Sample Question Paper – Set 1

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 1.
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) (b) Linguistic [1]
(ii) (d) Recognising and managing one's own and others' emotions [1]
(iii) (d) Being unable to meet high expectations [1]
(iv) (d) Root directory [1]
(v) (b) Enter, Survive, Grow, Retire [1]
(vi) (a) SDG 12 - Responsible Consumption and Production [1]

Q2. [5]

(i) (a) Both A and R are correct, and R is the correct explanation of A. [1]
(ii) Six [1]
(iii) (a) Both A and R are correct, and R is the correct explanation of A. [1]
(iv) (c) (TP + TN) / (TP + TN + FP + FN) [1]
(v) (b) 0 to 255 [1]
(vi) (d) Removing stop words [1]

Q3. [5]

(i) (c) Utility-based framework – The utility-based framework evaluates actions by maximising overall good and minimising harm for the greatest number of people. [1]
(ii) (c) Trial and error with rewards and penalties [1]
(iii) (c) (ii) and (iii) [1]
(iv) (a) The ratio of correctly predicted positive observations to total predicted positive observations. [1]
(v) (b) Classification [1]
(vi) (a) high term frequency and low document frequency [1]

Q4. [5]

(i) (b) Ensure that the choices we make do not cause unintended harm. – Ethical frameworks help us ensure that the choices we make do not cause unintended harm. [1]
(ii) Reinforcement [1]
(iii) (a) 0.80 – Precision = TP / (TP + FP) = 240 / (240 + 60) = 0.80. [1]
(iv) (a) Both A and R are correct, and R is the correct explanation of A. [1]
(v) 3 (Three) [1]
(vi) Token [1]

Q5. [5]

(i) (d) Data Acquisition – In Data Acquisition, we acquire data which becomes the base of the project, collecting it from reliable and authentic sources. [1]
(ii) (a) Artificial Intelligence [1]
(iii) Evaluation [1]
(iv) (b) Resolution [1]
(v) (b) Lemmatisation [1]
(vi) (c) Studi – Stemming removes the affix without checking meaning, giving 'studi'. Board 2025 Comptt asked the same idea with 'Sharing' (answer 'Shar'). [1]

SECTION – B

Answers to Subjective Type Questions (26 marks)

Q6. [2]

Differences in language or the use of jargon confuse the receiver [1]
Use simple, common words, or an interpreter/translation if needed [1]

Q7. **[2]**

Find out your strengths [0.5]
Set and focus on your goals [0.5]
Develop a plan to achieve your goals [0.5]
Stay loyal to your goals [0.5]

Q8. **[2]**

Careless sharing of account details and passwords on unsecure sites [1]
Unauthorised access when a computer is left logged in (e.g. at the office) [1]

Q9. **[2]**

Confidence: believing in oneself and one's abilities [1]
Patience or perseverance: not giving up when facing difficulty [1]

Q10. **[2]**

Green skills are the skills needed to protect and conserve the environment and promote sustainable development [1]
They are important for reducing environmental impact and building sustainable living [1]

Q11. **[2]**

A framework is a set of steps that help us in solving problems; it provides a step-by-step guide for solving problems in an organised manner. [1]
It ensures all relevant factors are taken into account and serves as a common language for communication, collaboration and consistency. [1]

Q12. **[2]**

Rule-based approach follows rules written by humans and cannot adapt to new data on its own. [1]
Learning-based approach learns patterns from data and improves with feedback. [1]

Q13. **[2]**

Training data is the set of examples used to teach the model patterns. [1]
Testing data is unseen data used to check the accuracy of the trained model. [1]

Q14. **[2]**

Precision = TP / (TP + FP): out of all cases predicted as positive, the proportion that are actually positive. [1]
Recall = TP / (TP + FN): out of all actual positive cases, the proportion that the model correctly identified. [1]

Q15. **[2]**

Each pixel value is stored as an 8-bit integer from 0 to 255, where 0 is black (no colour) and 255 is white or full colour.[1]
Since 1 byte = 8 bits gives 2^8 = 256 possible values, each pixel uses one byte of data. [1]

Q16. **[2]**

Step 1: collect the data and pre-process (normalise) it; Step 2: create a dictionary of unique words (vocabulary). [1]
Step 3: create document vectors by counting each vocabulary word in each document; Step 4: create document vectors for all documents. [1]

Q17. **[4]**

Bioethics is an ethical framework used in healthcare and life sciences, dealing with ethical issues related to health, medicine and biological sciences so that AI applications in healthcare adhere to ethical standards [1]
Respect for autonomy: enabling users to be fully aware of decision-making, e.g., users of an AI algorithm should know how it functions. [1]

Do not harm / non-maleficence: harm to anyone must be avoided at all costs; if no choice is available, the path of least harm must be chosen. [1]
Ensure maximum benefit / beneficence + justice: actions must focus on providing the maximum benefit, and all benefits and burdens must be distributed justly, irrespective of background. [1]

Q18. **[4]**

(i) Anomaly detection. [1]
(ii) Object classification. [1]
(iii) Object identification. [1]
(iv) Digit recognition. [1]

Q19. **[4]**

Rule-based approach follows fixed rules written by humans; example: an FAQ chatbot. [1]
Learning-based approach learns patterns from data and improves with feedback; example: a spam filter. [1]
A rule-based approach is static, so it cannot adapt to new kinds of spam on its own. [1]
A learning-based approach suits spam, because spam keeps changing and the filter learns from new emails. [1]

Q20. **[4]**

Such a model has 99% accuracy (9900 of 10,000 correct). [1]
It detects zero fraud cases, so its recall for fraud is 0. [1]
Accuracy hides this failure because most cases are legitimate, so the majority class dominates the score. [1]
Precision, recall and F1 score should be used, because they focus on the positive (fraud) class. [1]

Q21. **[4]**

Natural languages are governed by set rules of syntax, lexicon and semantics. [1]
They are redundant: the same information can be conveyed in multiple ways, e.g. 'It is raining' and 'Rain is falling'. [1]
They change over time: new words appear and meanings change, e.g. 'cool' is used to mean good. [1]
Meaning depends on context: 'red' means something different in 'the red car' and 'his face turned red with anger'. [1]

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