CENTRAL BOARD OF SECONDARY EDUCATION

CBSE 2026-27

Artificial Intelligence

Subject Code: 417 | Class X

Marking Scheme – Sample Question Paper – Set 2

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 2.
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) Topic sentence [1]
(ii) (d) Self-awareness [1]
(iii) (a) Operating system [1]
(iv) (d) Hover [1]
(v) (c) Every business idea needs to be unique or special [1]
(vi) (b) Affordable and clean energy [1]

Q2. [5]

(i) Three [1]
(ii) (d) Healthcare and life sciences – Bioethics is an ethical framework used in healthcare and life sciences. [1]
(iii) (a) Both A and R are correct, and R is the correct explanation of A. [1]
(iv) Overfitting [1]
(v) Computer Vision [1]
(vi) Corpus [1]

Q3. [5]

(i) (d) Data Acquisition – The stages in order are Problem Scoping, Data Acquisition, Data Exploration, Modelling, Evaluation, Deployment. [1]
(ii) (c) Teach the model patterns from examples [1]
(iii) (b) Both A and R are correct, but R is not the correct explanation of A. [1]
(iv) (b) 0.85 [1]
(v) (b) Object detection [1]
(vi) (d) A is incorrect, but R is correct. [1]

Q4. [5]

(i) (b) Relevant and authentic training data – Data collected from reliable sources is relevant and authentic, which improves the efficiency of the AI project. [1]
(ii) (b) The strength or importance of a connection between two nodes [1]
(iii) (b) The model performs well on training data but poorly on unseen data [1]
(iv) (a) 0.80 [1]
(v) (d) reduce the size of feature maps while keeping important features [1]
(vi) (a) Syntactic analysis (parsing) [1]

Q5. [5]

(i) (b) Bioethics – Bioethics is tailored to the healthcare sector; the other three are value-based frameworks. [1]
(ii) (d) Classifying emails as spam or not spam using emails already labelled [1]
(iii) Recall [1]
(iv) (c) upload a photo to find similar images and related web pages [1]
(v) (c) Pragmatic analysis [1]
(vi) (c) Auto generated captions on YouTube – Autogenerated captions turn natural speech into text in real time (handbook 6.2). SQP 2025-26 Q4(vi) tests the same application from a picture. [1]

SECTION – B

Answers to Subjective Type Questions (26 marks)

Q6. [2]

A word used in place of a noun [1]
Example: 'Kavita bought a book. She has a great book collection.' ('She' replaces 'Kavita') [1]

Q7. **[2]**

'A' stands for Achievable [1]
Breaking big goals into smaller parts makes them achievable [1]

Q8. **[2]**

Ram123 uses a common name and simple digits, so it is easy to guess [1]
R@m!2026q mixes capital and small letters, numbers and special characters, so it is harder to hack [1]

Q9. **[2]**

Making decisions (what to produce, how much and where to sell) [1]
Managing the business (arranging raw materials and assigning tasks) [1]

Q10. **[2]**

Organic farming is farming without chemical pesticides and fertilisers, using natural manure [1]
It produces better-quality, chemical-free crops [0.5]
It maintains soil quality for future use [0.5]

Q11. **[2]**

Sector-based frameworks are tailored to specific sectors or industries, e.g., Bioethics for healthcare. [1]
Value-based frameworks focus on fundamental ethical principles and moral philosophies guiding decision-making, e.g., the rights-based framework (or utility-based / virtue-based). [1]

Q12. **[2]**

Reinforcement learning learns by trial and error, using rewards and penalties received from its environment, and does not need a fixed labelled dataset. [1]
Supervised learning learns from labelled data and unsupervised learning finds patterns in unlabelled data; neither of them uses rewards and penalties. [1]

Q13. **[2]**

(a) Convolutional Neural Network (CNN). [1]
(b) Artificial Neural Network (ANN). [1]

Q14. **[2]**

The dataset is divided into two subsets: a training dataset, used to make the model learn, and a testing dataset, used to evaluate it on unseen data. [1]
The model's predictions on the testing data are compared with the expected values to estimate its performance on new data. [1]

Q15. **[2]**

Resolution is the number of pixels in an image across its width and height. [1]
Example: a monitor resolution of 1280×1024 means 1280 pixels across and 1024 pixels from top to bottom. [1]

Q16. **[2]**

A script bot works on pre-written scripts with limited functionality and needs little or no language processing; a smart bot is AI-based and flexible. [1]
A smart bot learns over time, requires coding and works on bigger databases; a script bot is easy to create and mostly free. [1]

Q17. **[4]**

(i) The algorithm was trained on healthcare expense data as a measure for health metrics rather than actual physical illness [1]
(ii) Framework: Bioethics [1]

Q18. **[4]**

Features: input attributes such as attendance and study hours. [1]
Label: the output to predict, such as Pass or Fail. [1]
Instance: one complete student record (row). [1]
Training data: the set of labelled student records used to teach the model. [1]

Q19. **[4]**

(a) Neural network (Artificial Neural Network). [1]
The input layer receives the data and passes it forward without processing. [1]
The hidden layers process the data through their nodes using weights and biases; each node works like a small machine learning algorithm. [1]
The output layer gives the final Answer to the user. [1]

Q20. **[4]**

(i) True Positives = 300. [1]
(ii) Precision = 300 / (300 + 40) = 0.88. [1]
(iii) Recall = 300 / (300 + 60) = 0.83. [1]
(iv) F1 = 2TP / (2TP + FP + FN) = 600 / 700 = 0.86. [1]

Q21. **[4]**

(i) 'studi', 'fli' and 'wolv' are not meaningful words. [1]
(ii) Lemmatisation takes longer, because it uses a dictionary and morphological analysis to find a meaningful base word. [1]
(iii) Stemming only chops off the affix and does not check meaning; lemmatisation returns the dictionary form 'study'. [1]
(iv) The affix is '-ing'. The stem and the lemma are both 'heal', so they are the same here. [1]

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