CENTRAL BOARD OF SECONDARY EDUCATION

CBSE 2026-27

Artificial Intelligence

Subject Code: 417 | Class X

Marking Scheme – Sample Question Paper – Set 7

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 7.
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) Visual communication [1]
(ii) (d) Self-regulation [1]
(iii) (a) Information leakage [1]
(iv) (b) Move [1]
(v) (a) Creative [1]
(vi) (b) Environmental citizenship [1]

Q2. [5]

(i) (b) Health, medicine and biological sciences [1]
(ii) Utility-based framework [1]
(iii) (a) A discrete category or class label [1]
(iv) (a) 0.15 – Error rate = |80 - 92| / 80 = 12 / 80 = 0.15. [1]
(v) Pooling [1]
(vi) (b) Collecting and pre-processing data [1]

Q3. [5]

(i) (d) Healthcare expense data as a measure of health – The algorithm used healthcare expense as a proxy for health needs; less money was spent on western-region patients, so their true illness was underestimated. [1]
(ii) (b) Reinforcement Learning [1]
(iii) (b) 0.90 – F1 = $2 \times 0.9 \times 0.9 / (0.9 + 0.9) = 0.90$. [1]
(iv) (a) False Positive [1]
(v) (c) A is correct, but R is incorrect. [1]
(vi) (a) Both A and R are correct, and R is the correct explanation of A. [1]

Q4. [5]

(i) Natural Language Processing [1]
(ii) (d) A is incorrect, but R is correct. [1]
(iii) (d) Bias [1]
(iv) 0.1 (|200 - 180| / 200 = 20 / 200) [1]
(v) (b) Spam filtering in e-mails [1]
(vi) Language translation (for example, Google Translate) [1]

Q5. [5]

(i) (a) Read, decipher, understand and make sense of human languages in a valuable manner – NLP deals with the interaction between computers and humans using natural language, extracting information from spoken and written words. [1]
(ii) (d) Regression [1]
(iii) (d) A legitimate email is marked as spam [1]
(iv) (d) Clarity and fine detail [1]
(v) (a) To make communication between computer systems and humans possible [1]
(vi) (b) Script bot [1]

SECTION – B

Answers to Subjective Type Questions (26 marks)

Q6. [2]

Feedback is the response given by the receiver to the sender [1]
It lets the sender check understanding and improve future messages [1]

Q7. **[2]**

Responsibility is owning one's tasks, decisions and their outcomes [1]
E.g. washing one's own dishes or completing homework without reminders [1]

Q8. **[2]**

Antivirus software detects and removes malicious programs from the computer [1]
Any two: Microsoft Defender, McAfee VirusScan, Norton AntiVirus, Quick Heal, Microsoft Security Essentials [1]

Q9. **[2]**

Once the business is stable, the entrepreneur thinks about expanding it [1]
Example: opening more branches or shops in other cities [1]

Q10. **[2]**

Solar energy provides clean electricity, supporting SDG 7 Affordable and Clean Energy [1]
It reduces greenhouse gas emissions, supporting SDG 13 Climate Action [1]

Q11. **[2]**

Data available for public usage only should be taken up; personal datasets should be used only with the consent of the owner, and one should never breach someone's privacy. [1]
Data should be taken only from reliable sources and should be relevant to the problem, as random data can be wrong or unusable. [1]

Q12. **[2]**

Testing data checks how well the model performs on unseen data, which is the real measure of learning. [1]
If the same data is used for both, the model may look accurate only because it has memorised the examples. [1]

Q13. **[2]**

An instance is one complete row of data that describes a single item. [1]
Example: one student's record with marks, attendance and grade. [1]

Q14. **[2]**

Error = |55 - 50| = Rs. 5 lakh (absolute difference). [1]
Error rate = |55 - 50| / 55 = 5 / 55 = 0.09 (about 9%). [1]

Q15. **[2]**

It applies several kernels to the input image to extract features such as edges and textures. [1]
It produces feature maps that are passed on to the next layers. [1]

Q16. **[2]**

It identifies the structure of input text by dividing a large chunk of text into paragraphs, sentences and words. [1]
It uses the lexicon, the collection of words and phrases of a language, to recognise these units. [1]

Q17. **[4]**

AI refers to any technique that enables computers to mimic human intelligence, i.e., make decisions, predict the future, learn and improve on its own. [1]
With respect to the type of data fed in the AI model, AI models are categorised into three domains: Data Sciences (Statistical Data), Computer Vision and Natural Language Processing [1]
Data Sciences takes input in the form of numeric and alphanumeric data [1]
Computer Vision takes input in the form of images and videos; NLP takes input in the form of text and speech [1]

Q18. **[4]**

(i) Reinforcement learning. **[1]**
(ii) By trial and error, using the rewards (+1) and penalties (–1) it receives. **[1]**
(iii) Rule-based approach. **[1]**
(iv) It can adapt to new rooms without a programmer rewriting the rules. **[1]**

Q19. **[4]**

(i) Unsupervised learning, since the bills are unlabelled. **[1]**
(ii) Association model. **[1]**
(iii) The bookstore can place bread and butter near each other or offer a combo discount, based on the relationship found. **[1]**

Q20. **[4]**

Bias: if the test data does not include all applicant groups, the model may judge some groups unfairly. **[1]**
Transparency: developers should disclose how the model was evaluated and its limitations, so that applicants and regulators can trust it. **[1]**
Accuracy: a high overall accuracy can hide errors for particular groups, so results must be reported honestly and per group. **[1]**
Reporting only overall accuracy without other metrics can mislead decision-makers into trusting a model that is unfair in practice. **[1]**

Q21. **[4]**

Chatbots answer customer queries at any time, 24 x 7, and handle common questions quickly, reducing waiting time. **[1]**
They reduce the workload and cost of human staff and can help generate sales leads. **[1]**
A script bot is easy to create and cheap, and it works on pre-written rules. **[1]**
Limitation: a script bot cannot answer questions outside its scripts and must pass them to a human executive. **[1]**

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