CENTRAL BOARD OF SECONDARY EDUCATION

CBSE 2026-27

Artificial Intelligence

Subject Code: 417 | Class X

Solutions

Sample Question Paper – Set 7

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

General Instructions

1. Please read the instructions carefully.
2. This Question Paper consists of 21 questions in two sections: Section A and Section B.
3. Section A has Objective type questions whereas Section B contains Subjective type questions.
4. Out of the given (5 + 16 =) 21 questions, a candidate has to answer (5 + 10 =) 15 questions in the allotted (maximum) time of 2 hours.
5. All questions of a particular section must be attempted in the correct order.
6. **SECTION A – OBJECTIVE TYPE QUESTIONS (24 MARKS):** (i) This section has 05 questions. (ii) Marks allotted are mentioned against each question/part. (iii) There is no negative marking. (iv) Do as per the instructions given.
7. **SECTION B – SUBJECTIVE TYPE QUESTIONS (26 MARKS):** (i) This section has 16 questions. (ii) A candidate has to do 10 questions. (iii) Do as per the instructions given. (iv) Marks allotted are mentioned against each question/part.
8. Part A (Employability Skills) carries 10 marks and Part B (Subject Specific Skills) carries 40 marks. Practical work (50 marks) is assessed separately.

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

Unit	Unit Name	Chapter	Marks
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
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**

SECTION – A

Objective Type Questions (24 marks)

Q1. Answer any 4 out of the given 6 questions on Employability Skills (1 × 4 = 4 marks) **[4]**

(i) A red traffic stop sign is an example of which type of communication?
(a) Oral communication (b) Written communication
(c) Visual communication (d) Interpersonal communication

(ii) Sticking to a study timetable despite distractions is an example of:
(a) Impulsiveness (b) Stress denial (c) Dependence (d) Self-regulation

(iii) Sharing personal details on unsecure websites can lead to:
(a) Information leakage (b) Faster printing
(c) Reduced spam (d) Better performance

(iv) Which operation moves a file to another location without creating a duplicate?
(a) Copy (b) Move (c) Backup (d) Save

(v) Reema has started her own restaurant. She keeps on trying new ideas to make different dishes for her customers. As an entrepreneur, Reema is:
(a) Creative (b) Impatient (c) Under-confident (d) Lazy

(vi) An environmentally responsible person who avoids wastage of water and food shows:
(a) Greed (b) Environmental citizenship
(c) Negligence (d) Ignorance

Q2. Answer any 5 out of the given 6 questions (1 × 5 = 5 marks) **[5]**

(i) Bioethics deals with ethical issues related to:
(a) Stock markets and trading (b) Health, medicine and biological sciences
(c) Computer games (d) Weather forecasting

(ii) Name the value-based framework that aims for the greatest benefit of the greatest number of people.

(iii) The output of a classification model is:
(a) A discrete category or class label (b) A continuous number
(c) A list of weights (d) A rule book

(iv) The actual value is 80 and the predicted value is 92. The error rate is:
(a) 0.15 (b) 0.12 (c) 0.13 (d) 0.85

(v) The CNN layer that reduces the size of the feature map is the _____ layer.

(vi) The first step of the Bag of Words algorithm is text normalisation. Which task is done in this step?
(a) Creating document vectors (b) Collecting and pre-processing data
(c) Adding the words to a dictionary (d) Creating a vector of words

Q3. Answer any 5 out of the given 6 questions (1 × 5 = 5 marks) **[5]**

(i) In the healthcare case study, the AI algorithm misjudged the health of patients from the western region because it was trained on:
(a) Actual physical illness data
(b) Doctor's handwritten notes
(c) Random noise
(d) Healthcare expense data as a measure of health

(ii) Which learning approach would be most suitable for training an AI model to park a car correctly?
(a) Supervised Learning (b) Reinforcement Learning
(c) Unsupervised Learning (d) Transfer Learning

(iii) A model has precision 0.9 and recall 0.9. Its F1 score is:
(a) 0.81 (b) 0.90 (c) 1.80 (d) 0.45

(iv) A healthy person is wrongly tested positive for a disease. This is a:
(a) False Positive (b) True Positive (c) True Negative (d) False Negative

(v) **Assertion (A):** Object detection can find several objects in one image.
Reason (R): Object detection assigns only one label to the whole image.
(a) Both A and R are correct, and R is the correct explanation of A.
(b) Both A and R are correct, but R is not the correct explanation of A.
(c) A is correct, but R is incorrect.
(d) A is incorrect, but R is correct.

(vi) **Assertion (A):** Chatbots are used in customer care to answer frequently asked questions.
Reason (R): Script bots are pre-programmed with rules to answer basic queries.
(a) Both A and R are correct, and R is the correct explanation of A.
(b) Both A and R are correct, but R is not the correct explanation of A.
(c) A is correct, but R is incorrect.
(d) A is incorrect, but R is correct.

Q4. Answer any 5 out of the given 6 questions ($1 \times 5 = 5$ marks) **[5]**

(i) The AI domain that deals with the interaction between computers and humans using natural language is _____.

(ii) **Assertion (A):** A rule-based chatbot can answer a new question that its rules never covered.
Reason (R): A rule-based system depends only on the rules that humans have written.
(a) Both A and R are correct, and R is the correct explanation of A.
(b) Both A and R are correct, but R is not the correct explanation of A.
(c) A is correct, but R is incorrect.
(d) A is incorrect, but R is correct.

(iii) Which ethical concern arises when the test data does not fairly represent all groups of people?
(a) Transparency (b) Efficiency (c) Accuracy only (d) Bias

(iv) The actual value is 200 and the predicted value is 180. The error rate is _____.

(v) Which of these is NOT an application of Computer Vision?
(a) Self-driving cars (b) Spam filtering in e-mails
(c) Medical imaging (d) Facial recognition

(vi) Name one NLP application that converts text or speech from one language into another.

Q5. Answer any 5 out of the given 6 questions ($1 \times 5 = 5$ marks) **[5]**

(i) The ultimate objective of Natural Language Processing is to:
(a) Read, decipher, understand and make sense of human languages in a valuable manner
(b) Store images in databases
(c) Increase processor speed
(d) Replace human doctors

(ii) Predicting the marks a student will score in an exam is an example of:
(a) Classification (b) Clustering (c) Association (d) Regression

(iii) In a spam filter, a False Positive occurs when:
(a) A spam email is placed in the inbox (b) A spam email is correctly caught
(c) A legitimate email reaches the inbox (d) A legitimate email is marked as spam

(iv) Which feature of an image is most affected by low resolution?
(a) Byte size of the kernel (b) Number of layers in a CNN
(c) Colour channels count (d) Clarity and fine detail

(v) What is the main purpose of NLP?
(a) To make communication between computer systems and humans possible
(b) To design computer hardware
(c) To store images as pixels
(d) To write machine code manually

(vi) These bots work on pre-programmed instructions inside the application or machine and are generally easy to develop. They are deployed in customer care to answer basic queries and connect users to human executives when they cannot handle the conversation. Identify the type of chatbot.

(a) Smart bot (b) Script bot (c) Learning bot (d) Voice bot

SECTION – B

Subjective Type Questions (26 marks)

Answer any 3 out of the given 5 questions on Employability Skills in 20–30 words each (2 × 3 = 6 marks)

Q6. What is feedback? Why is it important in the communication cycle? **[2]**

Q7. What is responsibility? Give one example of taking responsibility at home. **[2]**

Q8. What are antivirus? Name any 2 antiviruses. **[2]**

Q9. Explain the 'Grow' stage of the career process with an example. **[2]**

Q10. Explain how solar energy helps achieve SDG 7 and SDG 13. **[2]**

Answer any 4 out of the given 6 questions in 20–30 words each (2 × 4 = 8 marks)

Q11. Ajay wants to access data from various sources. Suggest him any two points that he needs to keep in mind while accessing data from any data source. **[2]**

Q12. Why should testing data be kept separate from training data? **[2]**

Q13. What is an instance (record) in a dataset? Give an example. **[2]**

Q14. A house was predicted at Rs. 50 lakh but sold for Rs. 55 lakh. Calculate the error and the error rate of the prediction. **[2]**

Q15. Describe the role of the convolution layer in a CNN. **[2]**

Q16. What does the lexical analysis stage of NLP do? Explain in 20-30 words. **[2]**

Answer any 3 out of the given 5 questions in 50–80 words each (4 × 3 = 12 marks)

Q17. Define Artificial Intelligence. List the three domains of AI and the type of data that is used in these domains. **[4]**

Q18. Read the following and answer the questions that follow: **[4]**

> A robot vacuum cleaner learns to avoid obstacles in new rooms. It gets +1 point when it moves freely and –1 point when it bumps into a wall.

(i) Name the type of learning used. (1)

(ii) Explain how the robot learns. (1)

(iii) Name the approach used if the programmer had written all the obstacle rules by hand. (1)

(iv) State one advantage of the learning-based approach in this case. (1)

Q19. Read the following and answer the questions that follow: **[4]**

> A bookstore studies 300 customer bills without any labels. It finds that customers who buy bread also often buy butter.

(i) Name the type of learning used. (1)

(ii) Name the model used to find this relationship. (1)

(iii) Explain how the bookstore can use this result, in 2 lines. (2)

Q20. Explain bias, transparency and accuracy as ethical concerns in the evaluation of an AI model used for loan approval. **[4]**

Q21. Explain how chatbots help customer service in an online business. Mention two advantages of chatbots and one limitation of a script bot. **[4]**

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