

**Kendriya Vidyalaya Sangathan, Mumbai Region**  
**2<sup>nd</sup> Pre-Board Examination 2025-2026**

**Class-X**

**SUBJECT: ARTIFICIAL INTELLIGENCE (417)**

**Max. Time: 2:00 Hours**

**Max. Marks: 50**

**General Instructions:**

1. Please read the instructions carefully.
2. This Question Paper consists of 21 questions in two sections: Section A & 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.

## SECTION A: OBJECTIVE TYPE QUESTIONS

<b>Q1.</b>	<b>Answer any 4 out of the given 6 questions on Employability Skills (1 x 4 = 4 marks)</b>	
i)	Visual communication among the people are dependent on _____ . (a) Signs, symbols and pictures (b) Text messages (c) Posture (d) Body language	1
ii)	You take ownership of a task, complete it sincerely, and report honestly even if it is delayed. Which of the following best describes this behaviour as one of the skills you must master to succeed in life? a) Self-awareness b) Responsibility c) Time management d) Adaptability	1
iii)	Ravi travelled to Sweden from India to pursue her higher education. But she doesn't know how to speak Swedish (language of Sweden). Because of this, she was unable to find a part time job. This is an example of _____. (a) Interpersonal barrier (b) Physical barrier (c) Organizational barrier (d) Linguistic barrier	1
iv)	Which key combination is used to copy selected text or files? a) Ctrl + C b) Ctrl + V c) Ctrl + X d) Ctrl + P	1
v)	The type of decision that involves company policies is called — a) Technical Decision b) Managerial Decision c) Strategic Decision d) Routine Decision	1
vi)	The term 'intergenerational equity' in sustainable development refers to: a) Equal rights for all age groups b) Fair distribution of resources between current and future generations c) Equal employment d) Uniform taxation policies	1
<b>Q2.</b>	<b>Answer any 5 out of the given 6 questions (1 x 5 = 5 marks)</b>	
i)	The primary purpose of data exploration in AI project cycle is a) To make data more complicated b) To simplify complex data c) To discover patterns and insights in data d) To visualize data	1
ii)	<b>Assertion:</b> Value-based frameworks in ethics provide guidance by focusing on fundamental ethical principles and values. <b>Reasoning:</b> These frameworks reflect different moral philosophies guiding ethical reasoning and are concerned with assessing the moral worth of actions.  a) Both Assertion and Reasoning are true, and Reasoning is the correct explanation of the Assertion. b) Assertion is true, but Reasoning is false. c) Both Assertion and Reasoning are true, but Reasoning is not the correct explanation of the Assertion. d) Assertion is false, but Reasoning is true.	1
iii)	Which learning model would you choose for a stock price prediction system? a) Clustering b) Classification c) Regression d) Association	1
iv)	What do we call the process of dividing a string into components words? (a) Regression (b) Word Tokenisation (c) Classification (d) Clustering	1
v)	What is the stem of the word “Making”? (a) Mak (b) Make (c) Making (d) Maker	1

vi)	When the predicted value of the AI model is positive, but the actual value is negative, it is called _____ a) True Positive c) False Positive	b) True Negative d) False Negative	1	
<b>Q3.</b>	<b>Answer any 5 out of the given 6 questions (1 x 5 = 5 marks)</b>			
i)	An AI agent playing a game and learning from its rewards and penalties is an example of: a) Supervised Learning c) Reinforcement Learning	b) Unsupervised Learning d) Evolutionary Learning	1	
ii)	Words that we want to filter out before doing any analysis of the text are called _____. a) Rare words c) Stop words	b) Frequent words d) Filter words	1	
iii)	_____ is an integral part of the model development process that helps to find the best model that represents our data and how well the chosen model will work in the future.		1	
iv)	A teacher uses a rule-based program to grade students' essays. The program was trained to look for specific keywords and phrases to assign grades. However, when students start using new words and expressions not included in the training, the program gives incorrect grades. What is the most likely reason for this issue? a) The rule-based program was not trained on enough essays. b) The rule-based approach is static and cannot adapt to new words or expressions. c) The students wrote essays that were too long. d) The program was not tested properly.		1	
v)	<b>State True or False:</b> In natural language, it is important to understand that a word can have multiple meanings and the meanings fit into the statement according to the context of it.		1	
vi)	Which of the following is valid according to Neural Networks? a) Neural Network contain 4 layers (input, processing, hidden and output layers) b) In Neural Networks every node is essentially a machine learning algorithm. c) Use the Neural Network if the dataset is small only. d) The input layers process the data with algorithms and supply to next layer.		1	
<b>Q4.</b>	<b>Answer any 5 out of the given 6 questions (1 x 5 = 5 marks)</b>			
i)	What is the main goal of using CNNs in Computer Vision? a) Text formatting c) Pattern detection in visuals		b) Image encryption d) File conversion	1
ii)	Assertion (A): Stemming is a technique used to reduce an inflected word down to its word stem. Reason (R): For example, the words “programming,” “programmer,” and “programs” can all be reduced down to the common word stem “program”.  (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 not correct (d) A is not correct but R is correct		1	

iii)	Mahima has made a model which predicts the performance of students in the various examinations in India. She collected the data of students' performance with respect to state, age, school and curriculum. Her model works with good accuracy and precision value. Which of the statements given below is incorrect?  (a) Data gathered with respect to state, age, school and curriculum is known as Testing Data. (b) Data given to an AI model to check accuracy and precision is Testing Data. (c) Training data and testing data are acquired in the Data Acquisition stage. (d) Training data is always larger as compared to testing data.	1
iv)	An app filters spam messages using a pre-trained dataset. What learning approach does it use? a) Supervised b) Unsupervised c) Reinforcement d) Association	1
v)	In an RGB image, what does a pixel with all values 0 represent? a) Maximum brightness b) Complete darkness c) Full saturation d) Grayscale tone	1
vi)	For _____ the whole corpus is divided into sentences. Each sentence is taken as a different data so now the whole corpus gets reduced to sentences. (a) Text Regulation (b) Sentence Segmentation (c) Tokenization (d) Stemming	1
<b>Q5.</b>	<b>Answer any 5 out of the given 6 questions (1 x 5 = 5 marks)</b>	
i)	What is the primary purpose of the Bag of Words model in Natural Language Processing? A) To translate text into multiple languages B) To extract features from text for machine learning algorithms C) To summarize documents for analysis D) To remove punctuation marks from text	1
ii)	How do voice assistants utilize NLP? A) To analyze visual data B) To process numerical data C) To understand natural language D) To execute tasks based on computer code	1
iii)	Which of the following comes under Problem Scoping? a) System Mapping b) 4Ws Canvas c) Data Features d) Web scraping	1
iv)	How is resolution typically expressed? A) By the number of pixels along the width and height, such as 1280x1024 B) By the brightness level of each pixel, ranging from 0 to 255 C) By the total number of pixels, such as 5 megapixels D) By the arrangement of pixels in a 2-dimensional grid	1
v)	_____ is an NLP tool to express an opinion, whether the underlying sentiment is positive, negative, or neutral. a. Text Classification b. Machine Translation c. Sentiment Analysis d. Automatic Text Summarization	1
vi)	A teacher's marks prediction system predicts the marks of a student as 80, but the actual mark obtained by the student is 95. What is the absolute error in the prediction? a) 5 b) 10 c) 15 d) 20	1

## SECTION B: SUBJECTIVE TYPE QUESTIONS

	<b>Answer any 3 out of the given 5 questions on Employability Skills (2x3=6M)</b> <b>Answer each question in 20 – 30 words.</b>	
Q6.	Describe the three types of barriers to communication in one sentence each with examples.	2
Q7.	State any two recreational activities which can help individuals transcend to a happier mental state and help manage stress.	2
Q8.	Why is it important to create backups of data?	2
Q9.	Explain the term 'self-motivation' in the context of entrepreneurship.	2
Q10.	What is hydroponic farming? Mention any two benefits of practising hydroponic farming.	2
	<b>Answer any 4 out of the given 6 questions in 20–30 words each (2x4=8M)</b>	
Q11.	A city government wants to implement a computer vision-based traffic monitoring system to detect traffic violations like running red lights and illegal parking. The system uses real-time video feeds and AI to automatically identify license plates and send violation notices. What are the key ethical considerations for successfully deploying this computer vision application, and how can these challenges is addressed?	2
Q12.	How is a rule-based AI model different from a learning-based model.	2
Q13.	What is meant by Overfitting of Data?	2
Q14.	How does Computer Vision contribute to autonomous vehicles?	2
Q15.	In a binary classification problem, a model predicts 70 instances as positive out of which 50 are actually positive. What is the recall of the model?	2
Q16.	Draw the Confusion matrix with following data the number of true positive = 100 the number of true negative 47 the number of false positive = 62 the number of false negative = 290	2
	<b>Answer any 3 out of the given 5 questions in 50– 80 words each (4 x 3 = 12 M)</b>	
Q17.	Read the case study below and answer the following questions: A Collage develops an AI system to shortlist students for a competitive scholarship. The algorithm is trained to prioritize students who complete online application forms quickly — assuming that faster completion reflects confidence, competence, and tech savviness. However, students who are not fluent in English, or who do not have access to a computer at home, take longer to fill out the form. As a result, many deserving students are unfairly rejected by the algorithm.  a) Identify two reasons why the algorithm gave biased results. b) Mention two bioethics principles that can help solve such a problem and explain how they apply.	4
Q18.	A healthcare provider wants to identify patterns in patient data to personalize treatment plans. They have a dataset with various patient attributes but no predefined labels indicating specific treatment plans. a) What type of learning approach is being used here? b) Explain how this approach helps in deriving insights from the dataset.	4
Q19.	Identify the name of the application of Machine Learning (ML) or Deep Learning (DL) being used in the following scenarios.	4

	<p>a) A fitness tracker uses AI to monitor your heart rate and learn what is normal for you. One evening, while you're relaxing and watching a horror movie, the tracker suddenly flags a spike in your heart rate as an anomaly — thinking something might be wrong.</p> <p>b) A wildlife camera is equipped with AI to monitor animals in a forest. It not only records movement of animals, but also identifies and classifies them into categories like “bird”, “mammal”, “insect”, etc.,</p> <p>c) A smart refrigerator is equipped with an internal camera and an AI system. One of its door features a display screen that shows a real-time image of the inside, capturing all the food items on various shelves. For each item, the system not only shows its actual image but also places an AI-generated label on top of it, such as: “Milk Carton”, “Apple”, “Ice Cream”.</p> <p>d) Imagine an app that helps you unlock your bike. Instead of typing a password, you simply scribble a numerical code like “5281” on your phone screen using your finger — even if your handwriting is a bit messy after a tough workout.</p>	
Q20.	<p>An AI model has been developed to test specimens of paddy plants to diagnose fungal, bacterial and viral infections. The model was tested on a data-set of about 630 tests and the resulting confusion matrix is as follows:</p> <ul style="list-style-type: none"> <li>▪ True Positives(TP): 110 tests correctly predicted the disease.</li> <li>▪ False Positives(FP): 60 tests incorrectly predicted the disease</li> <li>▪ True Negatives(TN): 410 tests correctly predicted the absence of disease</li> <li>▪ False Negatives (FN): 50 tests incorrectly predicted the absence of disease</li> </ul> <p>Calculate metrics such as accuracy, precision, recall, and F1-score</p>	4
Q21.	<p>Read the following three documents and answer the questions that follow:</p> <ul style="list-style-type: none"> <li>● Document 1: "Students love studying AI"</li> <li>● Document 2: "AI is transforming education"</li> <li>● Document 3: "Teachers and students explore AI tools"</li> </ul> <p>After performing basic text pre-processing (removing punctuation, converting to lowercase, and tokenizing), the documents become:</p> <ul style="list-style-type: none"> <li>● Document 1: [students, love, studying, ai]</li> <li>● Document 2: [ai, is, transforming, education]</li> <li>● Document 3: [teachers, and, students, explore, ai, tools]</li> </ul> <p>Questions:</p> <ol style="list-style-type: none"> <li>a) Create the dictionary (vocabulary) of unique words from all three documents.</li> <li>b) Construct the document vector for Document 3 using the dictionary.</li> <li>c) Explain how Bag of Words help in feature extraction.</li> <li>d) Why is the order of words not considered important in Bag of Words?</li> </ol>	4

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