KENDRIYA VIDYALAYA SANGATHAN LUCKNOW REGION
ARTIFICIAL INTELLIGENCE (SUBJECT CODE - 417)
PRE-BOARD EXAM CLASS X (SESSION 2025-2026)

Max. Time: 2 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

Q.1	Answer any 4 out of the given 6 questions on Employability Skills (1 x 4 = 4 marks)	
i.	Example of visual communication? a. No parking symbol b. Under CCTV surveillance symbol c. No entry symbol d. All of the above	1
ii.	SMART method can be used to set goals to make you successful in your career and personal life. What does ‘A’ in SMART stand for? a. Abrupt b. Accountable c. Achievable d. Admirable	1
iii.	Neha is a student of class X who loves to dance but does not take any professional tuition to learn dancing. One day while returning home from school, she saw an open air dance competition being held at the roadside. She participated out of interest and eventually secured her place in the top five among the participants and got rewarded as well. This motivated her greatly and she enrolled herself into a dance class. Now she thinks to take dancing as her career. The above example signifies which type of motivation? a. Internal b. External c. Forcibly d. Both a. and b.	1
iv.	BIOS stands for _____. a. Basic Input /Output System b. Basic In/Out System c. Based on In/Out System d. None of the above	1

v.	Rajesh launches a new app, but it fails to attract users and he faces financial losses. He gathers his team to discuss the failure, takes accountability for the oversight, and assures them that he will conduct thorough market research before the next launch. He _____. a. takes responsibility for his mistakes b. thinks before making a decision c. does not give up d. is innovative	1
vi.	A community initiates a tree-planting campaign to restore local forests, aiming to enhance biodiversity, prevent soil erosion, and provide habitats for wildlife. This initiative also includes educating residents about sustainable land use practices to protect their natural environment. Which SDG can you relate this initiative to? a. Clean Water and Sanitation b. Life on Land c. Affordable and Clean Energy d. Climate Action	1
Q. 2	Answer any 5 out of the given 6 questions (1 x 5 = 5 marks)	
i.	Fill in the blank: The AI project cycle is the cyclical process followed to complete an AI project. The AI Project Cycle mainly has ……..stages.	1
ii.	Assertion: Ethics provide guidance in distinguishing right from wrong. Reasoning: Ethics consist of a set of values and morals that aid individuals in making moral judgments and decisions. 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.	Assertion (A): Unsupervised Learning is a type of learning without any guidance. Reasoning (R): Unsupervised learning models work on unlabeled datasets, where the data fed into the machine is random and the person training the model may not have any prior information about it. a. Both A and R are true and R is the correct explanation for A b. Both A and R are true and R is not the correct explanation for A c. A is True but R is False d. A is false but R is True	1
iv.	Identify the type of model (classification, regression, clustering, association model): A marketing company wants to segment its customer base into distinct groups based on purchasing behavior for targeted marketing campaigns. They have a dataset containing information such as purchase history, frequency of purchases, and amount spent.	1
v.	Assertion: Grayscale images consist of shades of gray ranging from black to white, where each pixel is represented by a single byte, and the size of the image is determined by its height multiplied by its width. Reasoning: Grayscale images are represented using a three intensities per pixel, typically ranging from 0 to 255. Select the appropriate option for the statements given above: a. Both A and R are true and R is the correct explanation of A b. Both A and R are true and R is not the correct explanation of A c. A is true but R is false d. A is False but R is true	1
vi.	What distinguishes lemmatization from stemming? a. Lemmatization produces meaningful words after affix removal, while stemming does not. b. Lemmatization is faster than stemming. c. Stemming ensures the accuracy of the final word. d. Stemming generates shorter words compared to lemmatization.	1

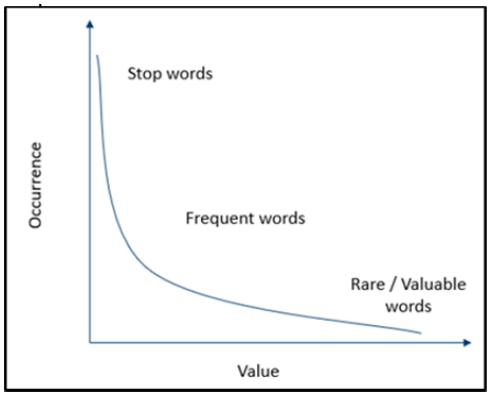
Q. 3	Answer any 5 out of the given 6 questions (1 x 5 = 5 marks)	
i.	One of the most reliable and authentic sources of information where we can download the authentic data for our project is __. a. Private websites b. Government websites c. Personal websites d. None of the above	1
ii.	Regression is one of the type of supervised learning model, where data is classified according to labels and data need not to be continuous, (True / False)	1
iii.	In a spam email detection system, out of 1000 emails received, 300 are spam. The system correctly identifies 240 spam emails as spam, but it also marks 60 legitimate emails as spam. What is the precision of the system? a. 80% b. 70% c. 75% d. 90%	1
iv.	A high F1 score generally suggests: a. A significant imbalance between precision and recall b. A good balance between precision and recall c. A model that only performs well on specific data points d. The need for more training data	1
v.	Object detection and handwriting recognition are examples of tasks commonly associated with: a. Computer vision b. Image processing c. Both computer vision and image processing d. Neither computer vision nor image processing	1
vi.	_____ is especially relevant when used to provide an overview of a news item or blog post, while avoiding redundancy from multiple sources and maximizing the diversity of content obtained. a. Automatic Summarization b. Sentiment Analysis c. Text Classification d. All of the above	1
Q. 4	Answer any 5 out of the given 6 questions (1 x 5 = 5 marks)	
i.	How are Ethical Frameworks for AI categorized? a. Into legal and illegal frameworks b. Into sector-based and value-based frameworks c. Into historical and contemporary frameworks d. Into theoretical and practical frameworks	1
ii.	Assertion (A) Accuracy helps us to evaluate the recall, precision and F1 Score at the same time. Reason (R) Accuracy defines how often the model predicts the correct output. 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.	Data about the houses such as square footage, number of rooms, features, whether a house has a garden or not, and the prices of these houses, i.e., the corresponding labels are fed into an AI machine. By leveraging data coming from thousands of houses, their features and prices, we can now train the model to predict a new house's price. This is an example of a. Reinforcement learning b. Supervised learning c. Unsupervised learning d. None of the above	1

iv.	A teacher's marks prediction system predicts the marks of a student as 75, but the actual marks obtained by the student are 80. What is the absolute error in the prediction? a. 5 b. 10 c. 15 d. 20	1
v.	What is the function of the Rectified Linear Unit (ReLU) layer in a CNN? a. To reduce the image size for more efficient processing b. To assign importance to various aspects/objects in the input image c. To get rid of negative numbers in the feature map and retain positive numbers d. To perform the convolution operation on the input image	1
vi.	TFIDF stands for _____. a. Team Frequency and Inverse Document Frequency b. Term Frequency and Inverse Document Frequency c. Top Frequency and Inverse Document Frequency d. Table Frequency and Inverse Document Frequency	1
Q. 5	Answer any 5 out of the given 6 questions (1 x 5 = 5 marks)	
i.	What is the primary domain of application for Bioethics? a. Agriculture b. Healthcare and life sciences c. Information technology d. Environmental conservation	1
ii.	A house was predicted to cost ₹4,53,000, but the actual selling price was ₹4,88,000. What is the error rate of this prediction (rounded to three decimal places)? a. 0.058 b. 0.071 c. 0.092 d. 0.117	1
iii.	How is resolution typically expressed? a. By the number of pixels along the width and height, such as 1280×1024 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
iv.	Statment1: The output given by the AI model is known as reality. Statement2:The real scenario is known as Prediction. a. Both Statement1 and Statement2 are correct b. Both Statement1 and Statement2 are incorrect c. Statement1 is correct but Statement2 is incorrect d. Statement2 is correct but Statement1 is incorrect	1
v.	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 Data Science Learning	1
vi.	Which of the following is NOT a step in Text Normalisation? a. Sentence Segmentation b. Tokenization c. Removing Stop words d. Document formatting	1

SECTION B: SUBJECTIVE TYPE QUESTIONS

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

Q. 6	What are the advantages and disadvantages of verbal communication?	2
Q. 7	What are the different stress management techniques?	2
Q. 8	What is antivirus? Name any 2 antiviruses.	2
Q. 9	What do entrepreneurs do when they run their business?	2
Q. 10	Mention any two human activities that lead to environmental degradation.	2
Answer any 4 out of the given 6 questions in 20 – 30 words each (2 x 4 = 8 marks)		

Q. 11	What roles does computer vision play in agricultural monitoring systems?	2
Q. 12	Sirisha and Divisha want to make a model which will organize the unlabeled input data into groups based on features. Which learning model should they use and why?	2
Q. 13	What is Reinforcement Learning? Explain how does it work?	2
Q. 14	What is a confusion matrix? What is it used for?	2
Q. 15	Determine the color of a pixel based on its RGB values mentioned below: (i) R=0, G=0, B=0 & R=255, G=255, B=255	2
Q. 16	Explain from the given graph, how the value and occurrence of a word are related in a corpus?  	2
Answer any 3 out of the given 5 questions in 50– 80 words each (4 x 3 = 12 marks)		
Q. 17	"Ethics are a set of values or morals which help us separate right from wrong and frameworks are step-by-step guidance on solving problems." As per the explanation of ethics describe what is the necessity for Ethical Frameworks in AI development? Also describe Ethical Frameworks with the help of suitable diagram.	4
Q. 18	Neural networks are said to be modeled the way how neurons in the human brain behave. A similar system is mimicked by the AI machine to perform certain tasks. Explain how neural networks work in an AI model and mention any three features of Neural Networks.	4
Q. 19	Ms. Sooji is a beginner in the field of Artificial Intelligence. She got confused among the core terms like Artificial Intelligence (AI), Machine Learning (ML), and Deep Learning (DL). Many times, these terms are used interchangeably but are they the same? Justify your answer. Help her in understanding these terms by drawing a well-labeled diagram to depict the interconnection between these three fields.	4
Q. 20	Create a document vector table from the following documents by implementing all the four steps of Bag of words model. Also depict the outcome of each step. Document 1: Aman and Avni are stressed Document 2: Aman went to a therapist Document 3: Avni went to download a health chatbot	4
Q. 21	A spam email detection system is used to classify emails as either spam (1) or not spam (0). Out of 1000 emails: • True Positives(TP): 150 emails were correctly classified asspam. • False Positives(FP): 50 emails were incorrectly classified asspam. • True Negatives(TN): 750 emails were correctly classified as not spam. • False Negatives(FN): 50 emails were incorrectly classified as not spam. Create confusion matrix using mention values and find Accuracy, Precision , Recall and F1 Score	4

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