KENDRIYA VIDYALAYA SANGATHAN, DELHI REGION
Pre-Board-II Examination 2025-26

Class – X | **Subject – Artificial Intelligence (417)**
M.M. – 70 | **Time – 2:00 Hrs**

General Instructions –

a) Please read the instructions carefully.
b) This Question Paper consists of 21 questions in two sections: Section A & Section B.
c) Section A has Objective type questions whereas Section B contains Subjective type questions.
d) **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.**
e) All questions of a particular section must be attempted in the correct order.
f) 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.
g) 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/par

SECTION A: OBJECTIVE TYPE QUESTIONS

Q1	**Answer any 4 out of the given 6 questions on Employability Skills (1 x 4 = 4 marks)**	
i.	Which component of communication refers to the environment where communication takes place? a) Sender b) Context c) Channel d) Feedback	1
ii.	What is the process of consciously observing and understanding your own feelings and motivations called? a) Self-esteem b) Self-confidence c) Self-awareness d) Time management	1
iii.	Which term describes the capacity of an individual to bounce back from difficulty and adapt to changing circumstances? a) Initiative b) Reliability c) Resilience d) Accountability	1
iv.	Which keyboard shortcut is commonly used to copy a selected file or text in Windows OS? a) Ctrl + X b) Ctrl + V c) Ctrl + C	1

	d) Ctrl + Z	
v.	What is the main characteristic of the 'Survive' stage in the entrepreneurial process? a) Expanding to new markets b) Establishing a regular customer base c) Earning just enough to cover costs d) Handing over the business to the next generation	1
vi.	Using energy-efficient light bulbs contributes to which 'Green Skill' principle? a) Waste Reduction b) Sustainable Energy Use c) Sustainable Water Use d) Climate Change Adaptation	1

Q. 2	**Answer any 5 out of the given 6 questions (1 x 5 = 5 marks)**	
i.	Which type of ethical framework for AI focuses on the outcomes of actions, suggesting that the most ethical decision is the one that produces the greatest good for the greatest number of people? a) Deontology-based b) Consequence-based c) Virtue-based d) Rights-based	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.	Which sub-field of AI mimics the human brain structure? a) Artificial Neural Networks b) Convolutional Networks c) Decision Trees d) Rule-based Systems	1
iv.	Which evaluation parameter takes into consideration all the correct predictions? a)Precision b) Recall c) Accuracy d) F1 score	1
v.	Which of these is a key function of Computer Vision? a) Text-to-speech conversion b) Image recognition c) Data compression d) Speech processing	1
vi.	Machine translation feature converts ____. (a) One language to another (b) Human language to machine language (c) Any human language to Programming (d) Machine language to human language	1

Q. 3	**Answer any 5 out of the given 6 questions (1 x 5 = 5 marks)**	
i.	A smart security camera is trained to identify and track intruders by drawing a bounding box around them in the video feed. This application is an example of: a) Image Classification b) Image Segmentation c) Object Detection d) Feature Extraction	1
ii.	Which of the following is not an application of machine learning and deep learning? a) Digit recognition b) Face detection c) Spam email classification d) Rule-based chat	1
iii.	Which metric is used to evaluate a classification model's performance by calculating the ratio of correctly predicted positive observations to the total actual positive observations? a) Accuracy b) Precision c) Recall d) F1 Score	1
iv.	Assertion (A): Regression models are used when output is a category like spam or not spam. Reason (R): Regression works with continuous numerical values, not categories. a) Both A and R are true and R is the correct explanation of A b) Both A and R are true but 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
v.	What is the term for breaking down an image into smaller, constituent parts, often represented by numerical values (pixels)? a) Resolution b) Digitization c) Aspect Ratio d) Color Depth	1
vi.	Which of the following is used for finding the frequency of words in some given text sample? a) Stemming b) Lemmatisation c) Bag of words d) None of the above	1

Q. 4	**Answer any 5 out of the given 6 questions (1 x 5 = 5 marks)**	
i.	The process of gathering, cleaning, and labelling data is primarily associated with which stage of the AI Project Cycle? a) Problem Scoping b) Data Acquisition c) Data Exploration d) Modelling	1

ii.	Which term describes the process where a computer is trained to learn from its environment through a system of rewards and penalties? a) Supervised Learning b) Unsupervised Learning c) Reinforcement Learning d) Semi-supervised Learning	1
iii.	In Natural Language Processing, which process is used to remove common, frequently occurring words like 'the', 'is', 'and', which have little meaning for text analysis? a) Tokenization b) Stop Word Removal c) Stemming d) Normalization	1
iv.	Which AI ethical risk is involved when an AI system makes a decision that negatively impacts certain groups of people because the training data was not representative? a) Surveillance b) Algorithmic Bias c) Data Privacy d) Transparency	1
v.	What is object detection in the context of CV? a) Changing image colors b) Compressing images c) Finding objects within an image d) Saving an image	1
vi.	Read the sentence: "The bear grizzly is a majestic animal." The system incorrectly identifies 'grizzly' as a verb. Which stage of NLP is responsible for assigning a grammatical category (like Noun, Verb, Adjective) to each word in a sentence? a) Tokenization b) Part-of-Speech (POS) Tagging c) Chunking d) Named Entity Recognition (NER)	1

Q. 5	**Answer any 5 out of the given 6 questions (1 x 5 = 5 marks)**	
i.	Which of the following comes under Problem Scoping? a)System Mapping b) 4Ws Canvas c) Data Features d) Web scraping	1
ii.	A teacher's marks prediction system predicts the marks of a student as 75, but the actual mark obtained by the student is 80. What is the absolute error in the prediction? a) 5 b) 10 c) 15 d) 20	1
iii.	In an RGB image, what does a pixel with all values 0 represent? a) Maximum brightness b) Complete darkness c) Full saturation	1

	d) Grayscale tone	
iv.	_____ is the outcome of the model wrongly predicting the positive class as negative class.	1
v.	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
vi.	What are the stemmed and lemmatized forms of the word 'studies'? a) Stemmed: study, Lemmatized: studies b) Stemmed: study, Lemmatized: study c) Stemmed: studies, Lemmatized: studies d) Stemmed: studi, Lemmatized: study	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 two main types of communication barriers? Give one example of each.	2
Q. 7	Explain the term goal setting and why it is important for self-management.	2
Q. 8	What is 'phishing'? Explain how a user can avoid becoming a victim of a phishing attack.	2
Q. 9	Describe two characteristics of a successful entrepreneur.	2
Q. 10	Mention any two ways to reduce waste and contribute to sustainable development.	2

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

Q. 11	Define Model Evaluation in the context of the AI Project Cycle.	2
Q. 12	Give one example each of an ethical consideration related to Data Privacy and Surveillance in AI	2
Q. 13	Differentiate between the training data set and the testing data set.	2
Q. 14	What is Color Depth in a digital image? How does it relate to the quality of an image?	2
Q. 15	What is the purpose of Tokenization in Natural Language Processing?	2
Q. 16	Identify the type of learning model and explain. a) This model is used to predict house prices, where the output is a continuous numerical value. b) This model is used to group similar customer records without any prior knowledge of the groups.	2

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

Q. 17	Read the case study below and answer the questions that follow: A popular social media platform uses an AI content filter to automatically remove hate speech. The AI model was predominantly trained on text data from one country, where certain slang words are considered offensive. When the platform expanded to other countries, the AI system incorrectly flagged and removed posts	4

	that used those same slang words, which are completely harmless in the new cultural context. a) Identify two reasons why the AI model failed in the new country. b) Mention and explain two bioethics principles that were violated in this scenario.	
Q. 18	Explain the concept of **Feature Extraction** in AI modelling. Why is it a crucial step before training a model?	4
Q. 19	Identify the name of the application of Computer Vision or NLP being used in the following scenarios: a) An app that translates text from a photo of a restaurant menu from French to English in real time. b) A self-driving car identifying all the traffic signs (e.g., 'Stop Sign', 'Yield') on the road. c) A system that reviews thousands of product reviews and classifies them as 'positive', 'negative', or 'neutral'. d) A system that creates a detailed outline (mask) of a tumor in a medical scan to help doctors focus on the affected area.	4
Q. 20	An AI system is designed to predict if a financial transaction is Fraudulent (Positive Class) or Legitimate (Negative Class). In a test of 500 transactions: * The model correctly identified 40 fraudulent transactions. * The model correctly identified 440 legitimate transactions. * The model predicted 10 transactions as fraudulent, but they were legitimate. * The model predicted 10 transactions as legitimate, but they were fraudulent. a) Draw the confusion matrix based on the above information. (2) b) Calculate the Precision of the model for the Fraudulent class. Show your working. (1) c) Write the number of False Negatives error made by the model. (1)	4
Q. 21	Consider the following documents and the pre-processing steps: * Document 1: "The cat sat on the mat" * Document 2: "A dog and a cat fought" * Document 3: "The mat and the dog are friends" The pre-processing involves converting to lowercase, tokenizing, and removing the stop words {'the', 'a', 'on', 'and', 'are'}. a) Create the dictionary (vocabulary) of unique words from all three processed documents. (1) b) Construct the document vector for Document 2 using the dictionary. (1) c) Briefly explain the difference between Stemming and Lemmatization in NLP (1) d) Why is stop word removal an important step in NLP preprocessing? (1)	4