

KENDRIYA VIDYALAYA SANGATHAN, CHANDIGARH REGION
ARTIFICIAL INTELLIGENCE (SUBJECT CODE - 417)
PRE-BOARD – II
CLASS X (SESSION – 2025-26)

Max Marks: 50

Max Time : 2 Hours

General Instructions:

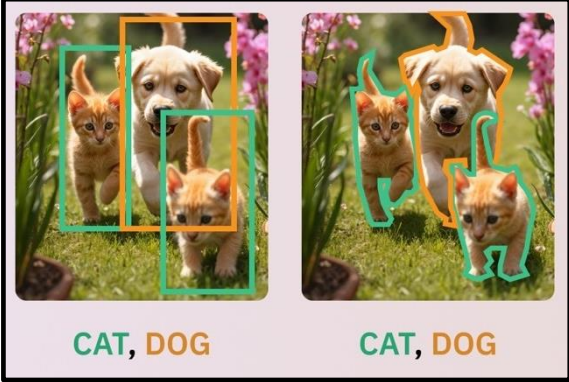
1. Please read the instructions carefully.
2. **This Question Paper consists of 21 questions in two sections: Section A & Section B.**
3. Section A has Objective type questions whereas Section B contains Subjective type questions.
4. **Out of the given (5 + 16 =) 21 questions, a candidate has to answer (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):**
 - (a) This section has 05 questions.
 - (b) Marks allotted are mentioned against each question/part.
 - (c) There is no negative marking.
 - (d) Do as per the instructions given.
7. **SECTION B – SUBJECTIVE TYPE QUESTIONS (26 MARKS):**
 - (a) This section has 16 questions.
 - (b) A candidate has to do 10 questions.
 - (c) Do as per the instructions given.
 - (d) 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.	A teacher is giving instructions to the students, but there is loud construction noise outside the classroom. So, the students cannot hear the instructions clearly. Which type of barrier is this ? (a) Linguistic Barrier (b) Physical Barrier (c) Cultural Barrier (d) Organizational Barrier	1
II.	Managing stress is about making a plan to be able to cope effectively with daily pressure. Always keep in mind the ABC of stress management. The acronym ABC stands for : (a) Ability, Burden, Concise (b) Adore, Belief, Cause (c) Adversity, Beliefs, Consequences (d) Ability, Balance, Consequences	1
III.	Rohan feels nervous before exams. He practices yoga and meditation daily to calm his mind. Which concept is used here ? (a) Stress Management (b) Time Management (c) Lack of Confidence (d) Overthinking	1

IV.	To remove the files of temporary folder, we type _____ in Run dialog box after pressing “Windows button + R” on the keyboard. (a) *temp# (b) %temp% (c) %temp* (d) *temp*	1
V.	Which of the following is a quality of a successful entrepreneur ? (a) Never Give up attitude (b) Laziness (c) Fear of Failure (d) Irresponsible	1
VI.	_____ avoids chemical, using natural fertilizers like cow dung to produce better, chemical-free crops while preserving the soil’s health. (a) Crop Rotation (b) Mixed Farming (c) Organic Farming (d) None of these	1
Q.2	Answer any 5 out of the given 6 questions (1 x 5 = 5 marks)	
I.	What is the significance of “Evaluation” Phase in the AI Project Cycle ? (a) Gathering data for future projects (b) Collecting feedback from the users (c) Building additional models (d) Testing model performance with new data	1
II.	A self-driving car fails to detect pedestrian crossing at night, resulting in a near accident. Which domain of AI technology should be enhanced to improve safety ? (a) Natural Language Processing (b) Computer Vision (c) Recommendation Systems (d) Statistical Data	1
III.	What is the purpose of a testing dataset in machine learning ? (a) To teach the model how to recognize patterns (b) To label the data for future predictions (c) To store the data for future training (d) To evaluate how well the model performs on unseen data	1
IV.	_____ is the difference between the predicted values and the actual values in a machine learning model. (a) Error (b) Accuracy (c) Recall (d) F1 Score	1
V.	Which of the following best describes Image Processing ? (a) Teaching AI to recognize faces (b) Modifying images to improve their quality (c) Enabling computers to make decisions based on images (d) Detecting objects in images	1
VI.	Which stage of NLP ensures that the sentence has meaningful words and phrases ? (a) Syntactic Analysis (b) Lexical Analysis (c) Pragmatic Analysis (d) Semantic Analysis	1
Q.3	Answer any 5 out of the given 6 questions (1 x 5 = 5 marks)	

I.	Frameworks provide a _____ way to solve problems. (a) Structured (b) Unstructured (c) Specific (d) Non-specific	1
II.	 Identify the type of Machine Learning Approach in the given picture . (a) Reinforcement Learning (b) Supervised Learning (c) Unsupervised Learning (d) Rule-Based Learning	1
III.	What is the correct formula for Accuracy in machine learning ? (a) $(TP \times TN) / (TP + TN + FP + FN)$ (b) $(TP + TN) / (TP + TN + FP + FN)$ (c) $TP / (TP + FP)$ (d) $TN / (TN + FP)$	1
IV.	Which term represents cases where the model incorrectly classifies a negative instance as positive ? (a) True Positive (b) False Positive (c) True Negative (d) False Negative	1
V.	Which of the following is NOT an application of Computer Vision ? (a) Google Translate (b) Face Filters (c) Face Recognition in Smartphones (d) Google Search by Image	1
VI.	What is the purpose of text normalization in NLP ? (a) To make text more complex (b) To convert text into another language (c) To remove all punctuation marks from text (d) To clean and simplify text while retaining its essential meaning	1
Q.4 Answer any 5 out of the given 6 questions (1 x 5 = 5 marks)		
I.	Which principle of bioethics emphasizes that individuals have the right to make their own decisions ? (a) Respect for Autonomy (b) Non-Maleficence (c) Beneficence (d) Justice	1
II.	Assertion (A) : Artificial Intelligence (AI) is a subset of Machine Learning (ML). Reason (R) : AI includes techniques that enables machines to mimic human intelligence, while ML is specific approach within AI. (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

III.	Which of the following is an example of a Classification Model ? (a) Predicting the temperature for tomorrow (b) Estimating the price of a used car (c) Detecting whether an email is spam or not (d) Predicting the number of hours a student needs to study	1
IV.	Which of the following is NOT the main ethical concerns in model evaluation ? (a) Bias (b) Computational Speed (c) Transparency (d) Accountability	1
V.	 Computer Vision is a field of AI that helps computers see and understand images, just like humans do. Computer performs different tasks to analyze and interpret images. Which type of Computer Vision Task(s) is/are used in the given picture ? (a) Classification and Classification +Localization (b) Object Detection and Instance Segmentation (c) Instance Segmentation and Classification (d) Classification and Object Detection	1
VI.	Count the number of Tokens in the paragraph : Chatbots are one of the most common applications of Natural Language Processing. A chatbot is a computer program designed to simulate human conversation through text, voice, or both. (a) 32 (b) 31 (c) 30 (d) 29	1
Q.5	Answer any 5 out of the given 6 questions (1 x 5 = 5 marks)	
I.	What are all the stages/phases of AI Project Cycle in sequence (Order) ? (a) Problem Scoping, Data Acquisition, Data Exploration, Modeling, Evaluation, Deployment (b) Data Acquisition, Data Exploration, Modeling, Problem Scoping, Evaluation, Deployment (c) Problem Scoping, Evaluation, Data Acquisition, Data Exploration, Modeling, Deployment (d) Problem Scoping, Data Acquisition, Modeling, Evaluation, Deployment, Data Exploration	1
II.	In an e-commerce website, which unsupervised learning model is used to recommend products based on previous purchases ? (a) Clustering Model (b) Regression Model (c) Classification Model (d) Association Model	1

III.	An AI Model Predicted Spam/Not Spam emails:			1
	Actual / Prediction	Spam	Not Spam	
	Spam	25	5	
	Not Spam	15	55	
	Calculate the Accuracy of this Model . (a) 50 % (b) 60 % (c) 70 % (d) 80 %			
IV.	What is the main function of computer vision in self-driving cars ? (a) Playing music while driving (b) Sending text messages (c) Controlling the car's speed (d) Detecting pedestrians, traffic signals and other vehicles			1
V.	What information does the document vector table provide ? (a) The frequency of each word across all documents (b) The frequency of each word in a single document (c) The total number of words in the entire corpus (d) The average word length in the entire corpus			1
VI.	What are the Stemmed and Lemmatized forms of "studies" ? (a) Stemmed: study, Lemmatized: study (b) Stemmed: studies, Lemmatized: studi (c) Stemmed: studi, Lemmatized: study (d) Stemmed: studi Lemmatized: studies			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 is Non-Verbal Communication ?	2
Q.7	Goal setting is a very essential factor in our personal life. List all the SMART methods to set the goals.	2
Q.8	What is an Operating System ?	2
Q.9	Explain Imitating Role and Employment Generation Role.	2
Q.10	Explain Organic Farming ?	2

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

Q.11	Explain Bioethics. List any two guiding principles of bioethics.	2
Q.12	What is the difference between Labeled Data and Unlabeled Data ?	2
Q.13	A doctor uses an AI model to check if a patient has flu or not. The model considers these symptoms: 1. Sore Throat and cough ($X_1 = 1$, weight = 0.5) 2. High Fever ($X_2 = 1$, weight = 0.6) 3. Muscle Pain ($X_3 = 0$, weight = 0.4) 4. Runny Nose ($X_4 = 1$, weight = 0.3) Bias (B) = -0.7. The threshold for diagnosing flu is 0. What will the AI model predict that the patient has flu or not ?	2
Q.14	What is Train-Test Split ?	2
Q.15	Differentiate between Computer Vision and Image Processing.	2
Q.16	What are Smart Chatbots ? Where are they used ?	2

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

Q.17	Explain all the stages / phases of AI Project Cycle.	4																																							
Q.18	Explain Supervised learning, Unsupervised learning and Reinforcement Learning with examples.	4																																							
Q.19	What do you mean by ANN ? Explain the structure and working of an ANN.	4																																							
Q.20	A manufacturing company deploys an AI model to identify defective products in its production line. The following table shows the actual and predicted classification for 12 products: <table border="1"> <thead> <tr> <th>Product</th><th>Actual Condition</th><th>Model's Prediction</th></tr> </thead> <tbody> <tr><td>Product 1</td><td>Defective</td><td>Defective</td></tr> <tr><td>Product 2</td><td>Not Defective</td><td>Not Defective</td></tr> <tr><td>Product 3</td><td>Defective</td><td>Defective</td></tr> <tr><td>Product 4</td><td>Not Defective</td><td>Defective</td></tr> <tr><td>Product 5</td><td>Defective</td><td>Not Defective</td></tr> <tr><td>Product 6</td><td>Defective</td><td>Defective</td></tr> <tr><td>Product 7</td><td>Not Defective</td><td>Not Defective</td></tr> <tr><td>Product 8</td><td>Defective</td><td>Defective</td></tr> <tr><td>Product 9</td><td>Not Defective</td><td>Not Defective</td></tr> <tr><td>Product 10</td><td>Defective</td><td>Not Defective</td></tr> <tr><td>Product 11</td><td>Not Defective</td><td>Defective</td></tr> <tr><td>Product 12</td><td>Not Defective</td><td>Not Defective</td></tr> </tbody> </table> Construct the Confusion Matrix and calculate Accuracy, Precision, Recall and F1 Score.	Product	Actual Condition	Model's Prediction	Product 1	Defective	Defective	Product 2	Not Defective	Not Defective	Product 3	Defective	Defective	Product 4	Not Defective	Defective	Product 5	Defective	Not Defective	Product 6	Defective	Defective	Product 7	Not Defective	Not Defective	Product 8	Defective	Defective	Product 9	Not Defective	Not Defective	Product 10	Defective	Not Defective	Product 11	Not Defective	Defective	Product 12	Not Defective	Not Defective	4
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Q.21	(a) John, a student of Class X was exploring the Natural Language Processing Domain. He got stuck while performing the text normalization. Help him to normalize the text on the segmented sentences given below: Doc 1 : Barun and Vijay are best friends. Doc 2 : Barun likesto play cricket but Vijay prefers to play online games. (b) Explain Bag of Words.	4																																							

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