Delhi Public School, Howrah

PERIODIC ASSESSMENT – III (2025-2026)

CLASS – X

Care must be taken not to write anything on the question paper. All the questions must be attempted in the correct sequence.

SUBJECT: ARTIFICIAL INTELLIGENCE (417)

THEORY EXAMINATION

Time Allowed:- 2 Hours **F.M.-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

1. Answer any 4 out of the given 6 questions on Employability Skills (1 x 4 = 4 marks)

i. Choose the appropriate example of active listening from the following.

A) Interrupting frequently B) Checking phone while listening

C) Avoiding questions D) Maintaining eye contact

ii. Which skill helps an individual remain calm and productive during challenges?

A) Stress Management B) Multitasking C) Typing speed D) Technical writing

iii. The _____ shortcut is used to permanently delete a file.

A) Ctrl + D B) Alt + Del C) Shift + Delete D) Shift + Backspace

iv. Who among the following can be called an entrepreneur?

A) Someone who copies ideas B) Someone who takes initiative to start a business

C) Someone who avoids risks D) Someone who works only for salary

v. Installing LED lights and using solar panels promotes which SDG?

A) SDG 7 – Affordable and Clean Energy B) SDG 4 – Quality Education

C) SDG 15 – Life on Land D) SDG 8 – Decent Work

vi. Identify the appropriate example of a physical barrier in communication?

A) Illness B) Anger C) Noise D) Stress

2. Answer any 5 out of the given 6 questions (1 x 5 = 5 marks)

i. The step where we analyze relevant information from collected data in AI Project Cycle is called _____.

A) Problem Scoping B) Data Acquisition C) Data Exploration D) Evaluation

ii. Consider the two statements given below and choose the correct option.
Assertion (A): Data Acquisition involves collecting data from various sources.
Reason (R): Clean data is essential for training accurate models.
A) Both A & R true and R is the correct explanation of A
B) Both A & R 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

iii. Identifying the target audience falls under which component of the Problem Canvas?
A) What B) Who C) Why D) Where

iv. The process of dividing data into training and testing parts is called _____.
A) Data Collection B) Data Labelling C) Data Visualization D) Train-Test Split

v. Which domain focuses on extracting useful information from images?
A) NLP B) Computer Vision C) Robotics D) Reinforcement Learning

vi. **State whether following statement is True or False. Rewrite the statement if False.**
Labelled data is mandatory for supervised learning.

3. Answer any 5 out of the given 6 questions (1 x 5 = 5 marks)

i. CNN is an example of _____.
A) Deep Learning models B) Rule-based systems C) Clustering algorithms D) Linear regression

ii. Which of the following is a feature in a dataset?
A) Row number B) Attribute like 'age' C) File size D) Folder name

iii. A model predicted 50 positives, out of which 40 were correct. Precision = _____.
A) 0.40 B) 0.50 C) 0.80 D) 0.90

iv. Consider the two statements given below and choose the correct option.
Statement I: Good models should generalize well.
Statement II: Generalization means performing well only on training data.
A) Statement I true, Statement II false B) Statement I false, Statement II true
C) Both true D) Both false

v. The task of separating foreground objects from background is called:
A) Classification B) Detection C) Annotation D) Image Segmentation

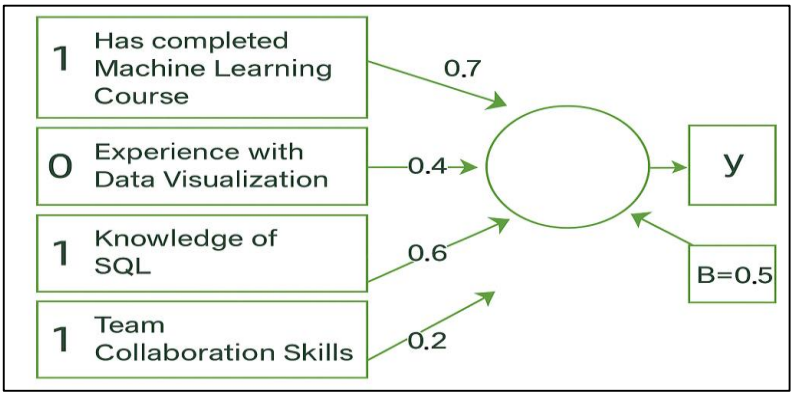
vi. Count the number of tokens in the sentence: "AI enhances learning through personalized feedback."
A) 8 B) 7 C) 6 D) 5

4. Answer any 5 out of the given 6 questions (1 x 5 = 5 marks)

i. Frameworks help provide _____ for decision-making.
A) Randomness B) Opinions C) Structure D) Emotions

ii. The dataset used to check model accuracy is called _____.
A) Training Set B) Testing Set C) Hidden Layer D) Validation Layer

iii. A company is using an AI-based scoring model to **evaluate candidates for a machine learning internship**. The model considers four key skills, each assigned a weight based on relevance to the role.



A bias value of 0.5 is added.
The formula used is: $y=w_1x_1+w_2x_2+w_3x_3+w_4x_4+(1\times b)$

What will be the value of y for the given scenario?

A) 1.0 B) 1.5 C) 2.0 D) 2.3

iv. Evaluating a model on training data only may cause _____.

A) Underfitting B) Bias removal C) High recall D) Overfitting

v. Image dimension 1024 × 768 represents _____.

A) Resolution B) Pixel depth C) Color depth D) Opacity

vi. Identify the NLP task: The system identifies emotional tone in text.

A) Text Summarization B) Sentiment Analysis C) Translation D) Parsing

5. Answer any 5 out of the given 6 questions (1 x 5 = 5 marks)

i. The middle value of an ordered dataset is:

A) Mean B) Mode C) Median D) Range

ii. Removing words like 'the', 'an', 'is' helps reduce _____.

A) grammar errors B) noise in data C) model size D) sentence length

iii. Object Detection results in_____.

A) Bounding boxes B) Audio output C) Token list D) Noise

iv. Predicting negative as positive is called _____.

A) True Negative B) False Negative C) True Positive D) False Positive

v. Script-based bots follow _____.

A) Predefined rules B) Deep learning C) Vision-based algorithms D) Genetic programming

vi. Stemmed form of "connected" is _____.

A) connecting B) connect C) connects D) connection

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.

6. What is leadership? Give two qualities of an effective leader.
7. Explain two ways to build self-discipline.
8. Rohan installs a free mobile app that asks for access to his contacts, photos, and location. Later, he notices unknown marketing calls and messages being sent to his friends. How might Rohan's personal data been leaked? Explain two possible ways.
9. Sneha plans to start her own online bakery. She takes risks, manages resources, and constantly thinks of new product ideas to stand out from competitors. Identify and explain any two entrepreneurial characteristics shown by Sneha.
10. What is eco-friendly living? Mention two benefits.

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

11. An AI chatbot modifies its responses over time by learning from previous conversations with users. Identify the type of learning involved and explain why.
12. Explain the significance of descriptive statistics (mean, median and mode) in summarizing datasets.
13. A school administrator uses a No-Code AI tool to shortlist scholarship applicants. Since the tool seems accurate and easy to use, decisions are made purely based on the AI's suggestions without verification. Later, it is found that the system filtered out students with incomplete digital access, even though they were eligible. Identify the ethical concern illustrated in the scenario and explain how it arises in No-Code AI.
14. Differentiate between RGB images and Grayscale images.
15. Which stage of NLP is applied when a sentence is corrected from "He going school is yesterday." to "He went to school yesterday."?
16. Text data collected from social media often contains inconsistent formats (uppercase text, emojis, repeated characters, slang, spelling variations). How does normalization help improve machine learning model performance?

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

17. Differentiate between the terms supervised, unsupervised, and reinforcement learning with examples.
18. Explain tokenization, stemming, and lemmatization with examples.
19. A smart-city project is developing an AI-powered surveillance and traffic monitoring system. The system uses multiple cameras installed across traffic signals, parking areas, and public spaces. Using these cameras, the AI

can identify vehicle types, detect violations, track moving objects, and separate people from the background to ensure safety and crowd analytics.

However, during testing, the system faced challenges:

- It could identify cars and bikes but could not differentiate between emergency vehicles and normal vehicles.
- It could track moving vehicles but failed to highlight exact road-lane boundaries.
- It struggled to separate pedestrians from background shadows in the night footage.
- It detected objects but could not label them with meaningful categories.

A) Explain the task of (i) Image Classification and (ii) Object Detection being used or required in this scenario.

B) Why is object tracking alone insufficient for smart traffic management? Explain with reasoning.

20. A hospital is testing an AI system designed to detect whether patients have a particular disease based on their medical reports. Out of 200 patients, the model correctly identified 70 patients who actually had the disease. It also correctly predicted 90 patients as disease-free.

However, the model predicted 20 patients as having the disease, but they were actually healthy. Additionally, it predicted 20 patients as disease-free, but they actually had the disease. Based on the above information do as directed.

A) Construct the confusion matrix for disease prediction.

B) Calculate the accuracy of the model. Show your working.

C) Calculate precision and recall for disease prediction.

D) Write one real-world consequence of low recall in medical diagnosis.

21. **Read the following three documents and answer the questions that follow:**

A customer-support team is analyzing messages received from users to understand what types of issues are most common. After collecting three sample messages, they perform text pre-processing (removing punctuation, converting to lowercase, and tokenizing).

Original Customer Messages

Document 1: "The app keeps crashing whenever I open the camera feature."

Document 2: "I cannot upload photos; the upload button is not working."

Document 3: "The camera button works, but the app becomes slow when saving photos."

After Pre-processing (tokens)

Document 1: [the, app, keeps, crashing, whenever, i, open, the, camera, feature]

Document 2: [i, cannot, upload, photos, the, upload, button, is, not, working]

Document 3: [the, camera, button, works, but, the, app, becomes, slow, when, saving, photos]

A) Create the dictionary (vocabulary) of unique words from all three documents.

B) Using this dictionary, construct the Bag of Words vector for Document 3.

C) Explain how the Bag of Words model helps the support team identify major customer issues.

D) Why does the Bag of Words model ignore the order of words, and how does this help in text classification?