PRACTICE PAPER
CLASS X
ARTIFICIAL INTELLIGENCE (CODE 417)

Time: 2 Hours
Maximum Marks: 50
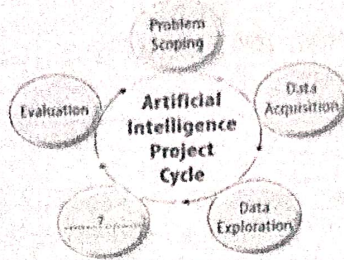
General Instructions:
1. Please read the instructions carefully.
2. This Question Paper consists of **21 questions** in two sections: **Section A & Section B.**
3. Section A has Objective type questions whereas Section B contains Subjective type questions.
4. Out of the given (5 + 16 =) 21 questions, 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):**
   (a) This section has 5 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

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

   (i) Computer virus can spread by doing which of the following?
      (a) Watching movies from unauthorized sources
      (b) Opening email attachments from unknown sources
      (c) Accessing infected files
      (d) All of these

   (ii) Eustress and Distress are also called .... stress and .... stress, respectively.

   (iii) Ajay, a class IX student, recently moved from Nepal to New Delhi. In the class, whenever any teacher asks questions, Ajay remains quiet although he scores excellent marks in all the subjects. What could be the reason for him not answering in the class?
      (a) Noise Barrier   (b) Physical Barrier   (c) Linguistic Barrier   (d) Cultural Barrier

   (iv) Which of the following is not a myth associated with entrepreneurs?
      (a) Entrepreneurs are continuous learners.   (b) Entrepreneurs are born, not made.
      (c) Entrepreneurs need a perfect plan.   (d) Entrepreneurs never fail.

   (v) 4Rs stand for—
      (a) Retake, Refuse, Reuse, Recycle   (b) Reduce, Refuse, Retake, Recycle
      (c) Reduce, Refuse, Reuse, Retake   (d) Reduce, Refuse, Reuse, Recycle

   (vi) Which of the following is a source of stress?
      (a) Work pressure   (b) Financial problems   (c) Starting a new job   (d) All of these

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

   (i) ReLU stands for ....

   (ii) Which tool is used for Data Visualization?
      (a) Matplotlib   (b) PowerBI   (c) Tableau   (d) All of these

   (iii) Aman is good at distinguishing between living and non-living things. Which type of intelligence does he possess?
      (a) Linguistic Intelligence   (b) Logical-Mathematical Intelligence
      (c) Naturalistic Intelligence   (d) Existential Intelligence

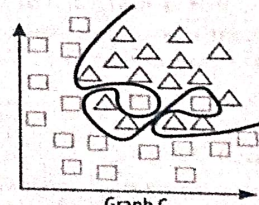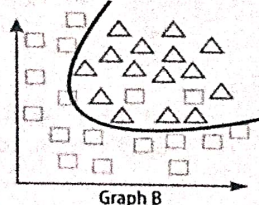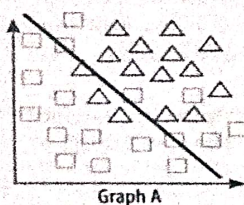(iv) Identify the missing phase in the given AI Project Cycle:

(v) Which of the following statements is true for Outliers?
  (a) Outliers are the data points that significantly differ from the majority of data.
  (b) Outliers can be found using various statistical methods.
  (c) Box plots can be useful for identifying outliers.
  (d) All of these

(vi) Which of the following technologies uses Computer Vision?
  (a) Image Recognition
  (b) Robotics
  (c) Web Scraping
  (d) Speech Recognition

3. Answer any 5 out of the given 6 questions.   (1 × 5 = 5 marks)
  (i) What is the function of a Scatter Plot?
    (a) To visualize numerical data over time
    (b) To compare categories in a bar chart
    (c) To show the distribution of data in a histogram
    (d) To display the relationship between two variables

  (ii) Which Machine Learning technique is used to build the game Snakes and Ladders?
    (a) Regression
    (b) Classification
    (c) Clustering
    (d) Reinforcement Learning

  (iii) Validation of data is defined as:
    (a) The sample data used to provide an unbiased evaluation of how well a model fits on the training dataset while tuning model hyperparameters
    (b) The actual dataset that we use to train the model
    (c) The final step in evaluating the model's performance on unseen data
    (d) None of these

  (iv) Which language is widely used for AI programming?
    (a) C   (b) COBOL   (c) Python   (d) Perl

  (v) Identify the given graphs A, B and C:
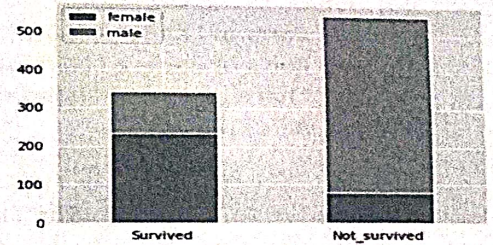

Graph A   Graph B   Graph C

    (a) A: Overfitting, B: Perfect fit, C: Underfitting
    (b) A: Underfitting, B: Perfect fit, C: Overfitting
    (c) A: Underfitting, B: Gaussian Distribution, C: Overfitting
    (d) A: Underfitting, B: Right Skewed, C: Overfitting

  (vi) Which of the following is a limitation of Bag of Words (BoW)?
    (a) The BoW approach can result in a high-dimensional feature space. As a result, finding significant patterns in the data may be challenging due to the curse of dimensionality.
    (b) The model ignores the location information of the word.
    (c) Bag of Words models do not respect the semantics of the word.
    (d) All of these

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

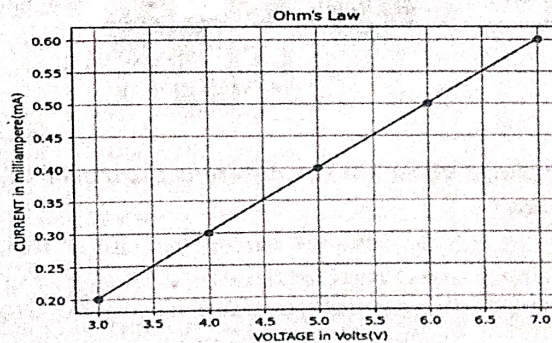(i) .... is a set of commands or rules that must be followed for a computer to perform calculations or other problem-solving operations.

(ii) The given graph shows the number of male and female passengers who survived and those who did not survive the sinking of a ship. What is the approximate percentage of male and female passengers who survived?

   (a) Male = 20%, Female = 90%
   (b) Male = 50%, Female = 20%
   (c) Male = 20%, Female = 45%
   (d) Male = 90%, Female = 45%

(iii) Which Python library is used for making image/video-based applications?
   (a) NumPy   (b) Pandas   (c) cv2   (d) NLTK

(iv) What is Machine Translation?
   (a) Converting one programming language to another programming language
   (b) Converting one human language to another human language
   (c) Converting any programming language to English
   (d) Converting machine language to human language

(v) What are the stepwise stages of AI Project Cycle?
   (a) Evaluation, Problem Scoping, Data Acquisition, Modelling, Data Exploration
   (b) Problem Scoping, Data Exploration, Data Acquisition, Modelling, Evaluation
   (c) Problem Scoping, Data Acquisition, Data Exploration, Modelling, Evaluation
   (d) Data Acquisition, Modelling, Data Exploration, Problem Scoping, Evaluation

(vi) Which of the following is false about NER?
   (a) NER stands for Nearby Entity Recognition.
   (b) NER is used for identification and classification of images.
   (c) NER is used to improve the accuracy of other NLP tasks such as parts-of-speech tagging and parsing.
   (d) Both (a) and (b)

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

(i) Who coined the term Artificial Intelligence?
   (a) Charles Babbage   (b) Greg Brockman   (c) John McCarthy   (d) Sundar Pichai

(ii) Which metric should we use for fraud detection?
   (a) Precision   (b) Recall   (c) F1 Score   (d) Accuracy

(iii) State True or False.
OCR (Optical Character Reader) uses NLP.

(iv) A student, good at both Physics and Computer Science, recently did a Physics experiment to verify Ohm's Law. He plotted graphs using Python to better understand and strengthen both the subjects. Which Python library did he use for the given graph?

   (a) Matplotlib   (b) SciPy   (c) cv2   (d) NLTK

(v) State True or False.

A subset of Machine Learning, Deep Learning uses neural networks to solve complex problems.

(vi) Which of the following is true about Parts-of-Speech Tagging?

   (a) Parts of Speech is assigned for each word dynamically as per the meaning.
   (b) Parts of Speech can be used to improve the accuracy of NLP tasks.
   (c) There are 9 main parts of speech and their tags.
   (d) All of these

SECTION B – SUBJECTIVE TYPE QUESTIONS

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

6. Why are there more male entrepreneurs than female ones?

7. What are some symptoms of stress?

8. (a) What do you mean by Directories?
   (b) How can we select and delete data from a Word file?

9. Write any two advantages of written communication.

10. Identify any one way in which we pollute the environment. Give solutions for the same.

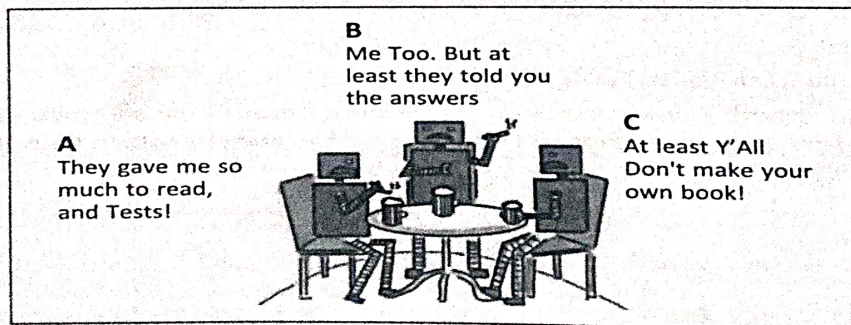**Answer any 4 out of the given 6 questions in 20–30 words each.**   (2 × 4 = 8 marks)

11. What do you mean by Precision in AI? An AI model performed 50 predictions. Out of these, 20 were True Positives, 10 were False Positives and 10 were False Negatives. Calculate Precision.

12. Write the functions of NumPy and Pandas.

13. Write any two applications of TF-IDF.

14. Differentiate between grayscale images and RGB images.

15. How are sustainable development goals related to AI?

16. What do you understand by AI Bias?

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

17. Explain the concept of Dimensionality Reduction and its significance in ML.

18. What do you mean by Text Normalization? Explain any two methods with the help of examples.

19. Identify the type of Machine Learning being represented by the given Robots A, B and C and also write about them.

20. What do you mean by AI Modelling? What are the different approaches to modelling?

21. Consider the following case study:

   Scenario: 550 people visited XYZ bank to exchange currencies. Out of these, only 500 people were successful.

   Model Predictions: 580 people exchanged currencies while 20 people were not able to do so.

   Create a Confusion Matrix based on the ground truth and the model predictions. Also calculate Accuracy and F1 Score.