PRACTICE PAPER 3
CLASS IX
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) Aditi is preparing for her exams but finds herself getting easily distracted by social media and her phone notifications. She realizes that staying focused on her studies is crucial to achieving her academic goals. She decides to implement a strategy to eliminate distractions and stay on track.

    Which self-management skill should Aditi practise to maintain focus and achieve her study goals?

    (ii) Which of the following is non-verbal communication?

    (a) Chatting   (b) Group Discussion   (c) Dancing   (d) Singing

    (iii) Which unit of the CPU is responsible for comparisons?

    (a) Memory Unit   (b) Arithmetic Logic Unit   (c) Control Unit   (d) None of these

    (iv) **Assertion (A):** Planning should be the first step in setting up a business, followed by arranging funds, executing marketing strategies and finally seeking feedback.

    Reasoning (R): A well-structured plan provides clarity and direction for securing funds, promoting the business and improving based on feedback.

    (a) Both A and R are true and R is the correct explanation for A.

    (b) Both A and R are true but R is not the correct explanation for A.

    (c) A is true but R is false.

    (d) A is false but R is true.

    (v) Imagine you are advising someone who is trying to set up a business but is confused about the order in which the different steps of the process should be handled. Identify the correct response from the following:

    (1) Financing   (2) Feedback   (3) Planning   (4) Marketing

    (a) (1), (2), (3), (4)   (b) (1), (3), (2), (4)   (c) (3), (1), (4), (2)   (d) (3), (1), (2), (4)

(vi) Which of the following interactions best describes how the biosphere, atmosphere and hydrosphere are interconnected?

    (a) The hydrosphere provides water to plants, which release oxygen into the atmosphere that is used by animals for respiration.

    (b) The atmosphere absorbs sunlight, which is used by the hydrosphere to regulate ocean currents.

    (c) The hydrosphere absorbs carbon dioxide from the atmosphere, which is used to grow plants in the biosphere.

    (d) The lithosphere provides nutrients to the biosphere, which then affects the composition of the atmosphere.

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

(i) **Assertion (A):** In the context of probability, the likelihood of a specific event happening in a random experiment is measured by the number of favourable outcomes divided by sample space.

    Reasoning (R): Sample space represents the set of all possible outcomes of a random experiment, which provides the basis for determining probabilities.
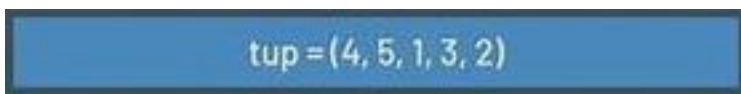
    (a) Both A and R are true and R is the correct explanation for A.

    (b) Both A and R are true but R is not the correct explanation for A.

    (c) A is true but R is false.

    (d) A is false but R is true.

(ii) You are developing a system that allows a computer to recognize handwritten digits. Initially, you provide the system with a dataset of images of handwritten digits along with their corresponding labels (*e.g.*, an image of '5' is labelled as '5'). The system uses this labelled data to improve its predictions over time and can generalize to recognize new, unseen handwritten digits.

    Which branch of Artificial Intelligence best describes this approach?

    (a) Supervised Learning   (b) Unsupervised Learning

    (c) Machine Learning   (d) Reinforcement Learning

(iii) **Statement 1:** In Python, len() finds the length of an object and append() is used for adding an element to a list.

    Statement 2: In Python, sum() calculates the sum of a list and remove() is used to remove an item from a list.

    (a) Both Statement 1 and Statement 2 are correct.

    (b) Both Statement 1 and Statement 2 are incorrect.

    (c) Statement 1 is correct but Statement 2 is incorrect.

    (d) Statement 2 is correct but Statement 1 is incorrect.

(iv) Identify the data type shown in the image. Is it mutable?

$$tup = (4, 5, 1, 3, 2)$$

(v) In data literacy, what does 'data visualization and communication' entail?

    (a) Storing data in physical formats

    (b) Presenting data using charts, graphs and infographics

    (c) Deleting unnecessary data

    (d) Ignoring data analysis

(vi) What is one of the main ethical concerns related to Generative AI?

    (a) Cannot learn from data

    (b) Uses too little data

    (c) Bias in generated content

    (d) Only works with high-quality data

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

(i) What will be the value of $(7//2) ** (8/4)$?

    (a) 9   (b) 6   (c) 9.0   (d) 6.0

(ii) What will be the output of the given code?

```
x = 10
y = 3
result = x // y + x % y
print(result)
```

(a) 3   (b) 4   (c) 5   (d) 7

(iii) Which of the following tasks is traditional AI suited for?

    (a) Creating new images   (b) Composing new music

    (c) Predicting stock market trends   (d) Writing creative stories

(iv) In Python, _____ method removes the last element from a list.

    (a) pop()   (b) reverse()   (c) print()   (d) append()

(v) Imagine you are planning a family vacation and are trying to decide between three different destinations. You collect the given data on each location: average temperatures, travel costs and available activities. By using your data literacy skills, you are able to analyze and compare this data to make an informed decision.

Which of the following best describes how data literacy helped in the given scenario?

    (a) By increasing the amount of data one collects

    (b) By understanding and making sense of data in various contexts

    (c) By reducing the use of data

    (d) By ignoring data in decision-making

(vi) In DIKW model, the transformation from Data to Wisdom involves several stages. Which of the following statements best describes the relationship between Knowledge and Wisdom?

    (a) Knowledge is raw and unprocessed while Wisdom involves making decisions based on experience and judgment.

    (b) Knowledge involves understanding facts while Wisdom is the ability to analyze those facts using algorithms.

    (c) Knowledge is the application of information in specific contexts while Wisdom involves analyzing patterns to predict future outcomes.

    (d) Knowledge involves the collection of data while Wisdom involves organizing it into a meaningful format.

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

(i) What will be the output of `True and False and True`?

    (a) `True`   (b) `False`   (c) `Yes`   (d) `No`

(ii) **Statement 1:** Data Storage Management in computing refers to storing and retrieving information from databases or memory.

Statement 2: Data Storage Management includes deleting unnecessary files from a computer's hard drive.

    (a) Both Statement 1 and Statement 2 are correct.

    (b) Both Statement 1 and Statement 2 are incorrect.

    (c) Statement 1 is correct but Statement 2 is incorrect.

    (d) Statement 2 is correct but Statement 1 is incorrect.

(iii) You are working with a team on a project where you are using Generative AI to create content for marketing materials. You have noticed that while the AI can generate impressive designs and text, there have been some instances where the output doesn't align with the brand's tone or message. What should the team do to ensure that the AI-generated content aligns with the brand's standards?

    (a) Allow the AI to work independently without human intervention

    (b) Rely on the AI to make all the creative decisions

    (c) Involve human oversight to review and verify the AI-generated content

    (d) Ignore human judgement and trust the AI's output entirely

(iv) Which of the following is true regarding AI?

    (a) It can understand complex human emotions.   (b) It can interpret highly ambiguous situations.

    (c) It can play chess or complex games.   (d) It can possess true common sense.

(v) Which of the following is not the purpose of a variable in Python?

    (a) Store data   (b) Manipulate data   (c) Reuse and reference   (d) Group data

(vi) You notice that your friend is struggling to figure out the mode of the given data. Help them find it.

    1, 2, 2, 3, 3, 3, 4, 4, 4, 4, 3, 3, 3, 2, 2, 1

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

(i) Imagine that a video of a public figure is created using Generative AI that appears real but is entirely fabricated. What is this type of content called?

    (a) Deepfakes   (b) Simulations   (c) Visualizations   (d) Animations

(ii) Which of the following is not a feature of Tableau Public?

    (a) Connecting to spreadsheets   (b) Creating interactive visualizations

    (c) Complex data analysis   (d) Publishing visualizations online

(iii) Which logical operator is used to check if either of the two conditions is True in Python?

    (a) and   (b) not   (c) or   (d) xor

(iv) Which of the following features would not be used for predicting whether a student will pass or fail an examination?

    (a) The number of hours they play   (b) The number of hours they study

    (c) The number of web series they watch   (d) The number of brothers they have

(v) What is the value of 'x' in the given expression?

```
x = (2>3)*(5<4)
```

    (a) `0`   (b) `1`   (c) `False`   (d) `True`

(vi) The following data represents the number of books read by 7 students in a month:

    12, 8, 15, 10, 14, 9, 13

    What is the median number of books read by the students?

    (a) 12   (b) 13   (c) 10   (d) 11

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. Explain the two major components of an ecosystem.

7. What is the difference between Website and Web Page?

8. Your cousin is planning to start a family-owned business and has come across the concept of a Joint Hindu Family Business while researching different structures. They are unsure whether this would be a good fit for their business. How would you explain the key features of this structure to them?

9. Why is self-management important?

10. Explain the difference between Declarative and Imperative Sentences with examples.

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

11. Your sibling is curious about how to document multi-line comments in Python. They often get confused when they need to write comments across multiple lines in their code. How would you help them?

12. You are having a casual conversation with a friend who loves playing board games and they are curious about probability. They heard that the probability of getting a sum of 15 when two dice are thrown is 0.6. They want to know whether this statement is true or false. What would your response be and why?

13. Your colleague is new to the concept of data analysis and is curious about the role of algorithms in data processing. They want to understand how algorithms help process data and perform analysis.

14. How can Generative AI contribute to environmental monitoring and disaster relief?

15. Explain mutable data types in Python with examples.

16. Explain Natural Language Generation and Natural Language Understanding in NLP.

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

17. Your relative wants to know how to cook Maggi noodles. Write a step-by-step algorithm that they can follow easily.

18. Your friend is studying Machine Learning and is a bit confused about the concept of ROC-AUC curve. They have learned about classification models but are unsure about how to evaluate their performance. Explain ROC-AUC curve and its significance in evaluating a classification model's performance. Provide an example of its application as well.

19. Classify the following images into Weak AI and Strong AI. What is the difference between Weak AI and Strong AI?

20. Answer the following questions:

 (i) Explain the use of Dot Plot in Data Analysis.

 (ii) Define and compare Mean, Median and Mode.

21. You are working on a machine learning project to predict whether a student will pass or fail an exam. After testing your classification model on a dataset of 800 students, you obtain the following results:

The model correctly predicted the students who passed as "Pass": 400

The model correctly predicted the students who failed as "Fail": 300

The model incorrectly predicted students who failed as "Pass": 50

The model incorrectly predicted students who passed as "Fail": 50

Based on these results, create a confusion matrix for your model. Find the value of True Positive, False Positive, True Negative and False Negative.