PRACTICE PAPER 3
CLASS IX
ARTIFICIAL INTELLIGENCE (CODE 417)
(SOLUTIONS)

1. (i) Goal-Setting

(ii) (c) Dancing

(iii) (b) Arithmetic Logic Unit

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

(v) (c) (3), (1), (4), (2)

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

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

(ii) (a) Supervised Learning

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

(iv) Tuples. No, it is immutable.

(v) (b) Presenting data using charts, graphs and infographics

(vi) (c) Bias in generated content

3. (i) (a) `9`

(ii) (b) `4`

(iii) (c) Predicting stock market trends

(iv) (a) pop()

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

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

4. (i) (b) `False`

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

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

(iv) (c) It can play chess or complex games.

(v) (d) Group data

(vi) 3

5. (i) (a) Deepfakes

(ii) (c) Complex data analysis

(iii) (c) or

(iv) (d) The number of brothers they have

(v) (a) 0

(vi) (b) 13

6. Components of an ecosystem are as follows:

(a) **Biotic Components:** Living organisms like plants, animals and microorganisms.

(b) **Abiotic Components:** Non-living factors such as sunlight, water, soil and air.

7.

Aspect	Website	Web Page
Definition	A collection of related web pages	A single document on the web
Purpose	Provides a complete platform or service	Delivers specific information or content
Example	Wikipedia (website hosting articles)	A specific article page on Wikipedia

8. Key features of Joint Hindu Family Business are:

   (a) **Membership by Birth:** Automatic co-partner membership for family members.

   (b) **Karta's Role:** The eldest male manages the business.

   (c) **Liability:** Karta has unlimited liability while the other members have limited liability. This structure suits family-run ventures.

9. Self-management enhances productivity by helping individuals stay focused, organized and stress-free. It improves decision-making, time management and goal-setting, ensuring better control over personal and professional responsibilities for success and well-being.

10.

Aspect	Declarative Sentence	Imperative Sentence
Definition	States facts or opinions	Issues commands or requests
Purpose	To provide information or make a statement	To direct someone to take action
Example	'The Earth orbits the Sun.'	'Close the door quietly.'

11. Multi-line comments are enclosed within triple quotes (''' or """).

    Example:

```
'''
This is a multi-line
comment in Python.
'''
```

    These comments explain larger code blocks and improve readability.

12. The given statement is false. The maximum possible sum with two dice is 12, *i.e.*, rolling two sixes. Getting a sum of 15 when two dice are thrown is impossible since a die only has values from 1 to 6.

13. Algorithms transform raw data into insights by sorting, filtering and clustering data. They identify patterns, predict trends and automate tasks, enabling efficient data processing and decision-making across various industries like marketing, healthcare and finance.

14. Generative AI analyzes satellite images to detect deforestation, predict natural disasters and monitor environmental changes. It helps in disaster relief by modelling affected areas and providing quick, actionable insights for faster response and recovery.

15. Mutable data types in Python are:

    (a) **Lists:** Allow adding, removing or modifying items. Example: `my_list.append(5)`

    (b) **Dictionaries:** Enable updating key-value pairs. Example: `my_dict['key'] = 'value'`

    These types are flexible and are often used for dynamic data manipulation.

16. Natural Language Generation (NLG) allows machines to produce human-like text by converting structured data into meaningful sentences. Applications include generating chatbot responses, summarizing data and creating reports or stories for improved communication.

    Natural Language Understanding (NLU) enables machines to comprehend human language by analyzing syntax, semantics and context. It is used in tasks like speech-to-text, language translation and intent recognition to interpret user input effectively.

17. The step-by-step algorithm for cooking Maggi noodles is as follows:

    (a) Boil water in a pan.

    (b) Add Maggi noodles and tastemaker.

(c) Stir occasionally to ensure even cooking.

(d) Cook for 2-3 minutes on medium heat.

(e) Turn off the heat and serve hot.

This simple algorithm ensures quick preparation of Maggi noodles by following a systematic process. It can be customized with additional ingredients like vegetables or spices, making it a versatile and easy-to-follow recipe for all.

18. ROC-AUC curve evaluates a classification model's performance by plotting the true positive rate (sensitivity) against the false positive rate (1–specificity).

(a) ROC Curve helps visualize a model's ability to distinguish between classes.

(b) AUC (Area Under Curve) measures the overall performance (closer to 1 is better).

For example, in spam detection, a high AUC value indicates that the model effectively classifies emails as 'Spam' or 'Not Spam'. It provides a reliable metric to compare different models and optimize classification performance.

19. Here, the first image represents Strong AI whereas the second image represents Weak AI.

Aspect	Weak AI	Strong AI
Definition	Performs specific tasks	Mimics full human intelligence
Learning Ability	Limited to pre-programmed functions	Capable of autonomous learning and reasoning
Examples	Alexa, Siri, chess-playing bots	Hypothetical advanced AI systems

Weak AI focuses on narrow tasks like virtual assistants. Strong AI, still hypothetical, aims to exhibit human-like cognitive abilities, including reasoning, understanding and learning across diverse domains without human intervention.

20. (i) Dot Plot is a graphical tool that displays data distribution by marking dots for each data point. It helps identify clusters, gaps and outliers effectively.

(ii) **Mean:** It is the arithmetic average of all values and is calculated by dividing their sum by the total number of values.

Median: It is the middle value of a sorted dataset; if even, it is the average of the two middle values.

Mode: It is the most frequently occurring value in a dataset.

For example, in a dataset `{2, 3, 3, 4, 5}`, the mean is `3.4`, the median is `3` and the mode is `3`. Each measure gives unique insights into data distribution.

21.

Actual/Predicted	Predicted Pass	Predicted Fail
Actual Pass	400	50
Actual Fail	50	300

- **TP:** 400 students correctly predicted as passing.
- **FP:** 50 students incorrectly predicted as passing.
- **TN:** 300 students correctly predicted as failing.
- **FN:** 50 students incorrectly predicted as failing.

This matrix assesses the model's prediction accuracy.