

**SAMPLE QUESTION PAPER (SOLVED)-II**  
**CLASS IX (SESSION 2024-2025)**

**Max. Time Allowed: 2 Hours**

**Maximum Marks: 50**

**Fill in the Blanks**

1. The \_\_\_\_\_ is all about how to convert a real-life problem or challenge into a computer-based AI model.

**Ans.** AI project cycle

2. The \_\_\_\_\_ is collected to ensure that the system operates in a proper manner.

**Ans.** data

3. Machine learning can be treated as a \_\_\_\_\_ because it is difficult to interpret the data inside the model used and also how the values from the model are calculated and how it should be communicated to the \_\_\_\_\_ and other concerned organizations.

**Ans.** black box, end-users

4. \_\_\_\_\_ in itself is a skill where the students need to master themselves by finding relevant details.

**Ans.** Data exploration

5. Data acquisition is also known as \_\_\_\_\_.

**Ans.** data collection

6. Data \_\_\_\_\_ ensures that individuals have control over their personal information.

**Ans.** privacy

7. Data \_\_\_\_\_ enables individuals and organizations to understand, analyze, and interpret data.

**Ans.** literacy

8. The first step in becoming data \_\_\_\_\_ is to identify and understand the sources of the data.

**Ans.** literate

9. Data \_\_\_\_\_ fosters critical thinking skills and enhances problem-solving abilities.

**Ans.** literacy

10. \_\_\_\_\_ that prioritize data security safeguard sensitive information from unauthorized access

**Ans.** Organizations

11. Integral calculus focuses on the accumulation of quantities and helps to compute \_\_\_\_\_.

**Ans.** areas, volumes, and other quantities





12. Graphs are used to represent data, such as \_\_\_\_\_, \_\_\_\_\_, or \_\_\_\_\_.

**Ans.** social networks, web pages, transportation systems

13. Graph algorithms help in finding patterns, clusters, or \_\_\_\_\_ in data.

**Ans.** shortest paths

14. An example of AI Pattern generator is \_\_\_\_\_.

**Ans.** <https://www.patterned.ai/>

15. Vertex AI is a tool that generates captions for images by observing \_\_\_\_\_.

**Ans.** patterns

16. Deepfakes use a machine learning model called \_\_\_\_\_ Adversarial Network.

**Ans.** Generative

17. Conventional AI is also known as classic or \_\_\_\_\_ AI.

**Ans.** symbolic

18. GANs consist of two neural networks—a \_\_\_\_\_ and a discriminator.

**Ans.** generator

19. Variational Autoencoders (VAEs) learn low-dimensional representation of \_\_\_\_\_ data.

**Ans.** input

20. Generative AI can write engaging articles and blog posts, known as \_\_\_\_\_ generation.

**Ans.** text

21. \_\_\_\_\_ is a Python library used for scientific computation.

**Ans.** NumPy

22. \_\_\_\_\_ is an open-source Python module for natural language processing.

**Ans.** nltk

23. Python code is clearly defined and \_\_\_\_\_ to the eyes.

**Ans.** visible

24. Python can run on a wide variety of hardware platforms and has the same \_\_\_\_\_ on all platforms.

**Ans.** interface

25. Python supports GUI applications that can be created and ported to many systems, such as Windows, \_\_\_\_\_, and Unix.

**Ans.** Macintosh



**Multiple Choice Questions**

1. Which method involves converting real-world phenomena into signals for data collection?
- (a) Surveys (b) Web Scraping  
(c) Sensors (d) API
- Ans. (c) Sensors
2. What type of data is collected from sources like interviews, surveys, and feedback forms?
- (a) Secondary Data (b) Primary Data  
(c) Quantitative Data (d) Discrete Data
- Ans. (b) Primary Data
3. Which of the following is an example of continuous data?
- (a) Number of shirts owned (b) Number of pets in a family  
(c) Weight of an individual (d) Number of children in a family
- Ans. (c) Weight of an individual
4. What does data augmentation involve?
- (a) Collecting primary data (b) Enhancing dataset size and diversity  
(c) Data anonymization (d) Web scraping
- Ans. (b) Enhancing dataset size and diversity
5. Which feature in a dataset is known as target variable?
- (a) Independent feature (b) Dependent feature  
(c) Continuous feature (d) Discrete feature
- Ans. (b) Dependent feature
6. Which of the following represents data points, features, or other quantities in AI?
- (a) Scalars (b) Tensors  
(c) Matrices (d) Vectors
- Ans. (d) Vectors
7. What type of statistics is used to summarize and describe the main features of a dataset?
- (a) Descriptive statistics (b) Inferential statistics  
(c) Probabilistic statistics (d) Analytical statistics
- Ans. (a) Descriptive statistics
8. In probability theory, what is used to make decisions under uncertainty and infer relationships between variables?





- (a) Probability distributions                      (b) Probabilistic models  
(c) Probability density functions              (d) Probability mass functions

Ans. (b) Probabilistic models

9. Which branch of calculus helps to compute areas, volumes, and other quantities that can be useful for AI applications?

- (a) Differential calculus                      (b) Integral calculus  
(c) Multivariable calculus                      (d) None of the above

Ans. (b) Integral calculus

10. What does descriptive statistics involve?

- (a) Summarizing data                      (b) Making predictions  
(c) Analyzing probability                      (d) Creating models

Ans. (a) Summarizing data

11. Conventional AI is also known as:

- (a) Neural AI                      (b) Symbolic AI  
(c) Probabilistic AI                      (d) Generative AI

Ans. (b) Symbolic AI

12. Which component is NOT part of GANs?

- (a) Generator                      (b) Discriminator  
(c) Transformer                      (d) None of the above

Ans. (c) Transformer

13. Which generative model learns low-dimensional representation of input data?

- (a) GANs                      (b) VAEs  
(c) RNNs                      (d) CNNs

Ans. (b) VAEs

14. Generative AI helps to create content in all the following forms EXCEPT:

- (a) Text                      (b) Images  
(c) Hardware                      (d) Audio

Ans. (c) Hardware

15. What is the main objective of conventional AI?

- (a) Creating new data  
(b) Classification, regression, and clustering  
(c) Generating content  
(d) Image synthesis

Ans. (b) Classification, regression, and clustering





16. Which of the following is not a Python keyword?

- (a) pass (b) eval  
(c) assert (d) return

Ans. (b) eval

17. Which symbol is used for comments in Python?

- (a) // (b) /\*  
(c) # (d) ;

Ans. (c) #

18. Which type of programming style does Python support?

- (a) Object-Oriented (b) Procedural  
(c) Functional (d) All the above

Ans. (d) All the above

19. Which of the following is a valid Python variable name?

- (a) 1 variable (b) variable 1  
(c) variable-1 (d) variable@1

Ans. (b) variable 1

20. What is the correct file extension for Python files?

- (a) .pyth (b) .py  
(c) .pt (d) .python

Ans. (b) .py

### Short Answer Questions

1. What is the difference between data acquisition and data exploration stages in AI project cycle?

Ans. **Data Acquisition:** The process of gathering and measuring information on variables of interest in an established systematic fashion.

**Data Exploration:** This involves analyzing data to discover patterns, spot anomalies, and test hypotheses to ensure that the data which is collected is useful and relevant to the problem that is being solved.

2. What is Modeling? Explain the purpose of the modeling stage in the AI project cycle.

Ans. **Modeling:** Creating a representation of the problem in a formal mathematical or computational framework. The purpose is to develop algorithms and structures that can learn from the data and make predictions or decisions based on the new data.

3. Explain the term 'IoT' in brief.

Ans. **IoT (Internet of Things):** It is a network of interconnected devices that





communicate and exchange data with each other via the internet. These devices range from everyday objects like home appliances to industrial machines.

**4. What do you mean by 4W's problem composition?**

**Ans. 4W's problem composition:** It is a method that is used in problem scoping which involves answering four questions: What is the problem? Why is it a problem? Who does it affect? Where does it occur? This helps in clearly defining and understanding the problem.

**5. How is 'Who' block different from 'Why' block in problem scoping?**

**Ans. Who block:** This helps to identify the stakeholders who are affected by the problem.  
**Why block:** This helps in explaining the reasons behind the problem's existence and its significance.

**6. What is the role of a system map in the AI project cycle?**

**Ans.** The system map provides a visual representation of the components that are involved in the AI project, showing how they interact and influence each other. It helps in understanding the system's complexity and identifies potential issues and areas for improvement.

**7. What is the significance of the DIKW model in data literacy?**

**Ans.** The DIKW model illustrates the different levels of data processing from raw data to wisdom and highlights the importance of transforming data into useful information, knowledge, and ultimately wisdom for to make informed decisions.

**8. How does data literacy contribute to individual and organizational success?**

**Ans.** Data literacy enhances career advancement opportunities for individuals and improves decision-making, innovation, and revenue maximization for organizations.

**9. How can organizations promote data literacy among their employees?**

**Ans.** Organizations can promote data literacy by offering training programs, providing access to data analysis tools, fostering a culture of data-driven decision-making, and by recognizing and rewarding employees who demonstrate strong data literacy skills.

**10. How do graphs contribute to AI?**

**Ans.** Graphs represent data, such as social networks or web pages, and graph algorithms help to find patterns, clusters, or shortest paths in data.

**11. What is pattern recognition in machine learning?**

**Ans.** Pattern recognition is the process of identifying trends to determine a by using algorithms to compare incoming data against the existing information that is stored in databases.



**12. How does probability theory assist in weather forecasting?**

**Ans.** Probability of Precipitation (PoP) is used in weather forecasts to indicate the likelihood of precipitation occurring, which helps in making informed predictions.

**13. What is ChatGPT and what does it do?**

**Ans.** ChatGPT is a generative AI model developed by OpenAI that interacts in a conversational form to answer questions and generate text, mimicking human-like responses.

**14. What role does GitHub Copilot play in coding?**

**Ans.** GitHub Copilot assists developers by providing code completion, snippets, explanations, and context-based guidance, thus enhancing productivity and learning.

**15. What are deepfakes and how are they created?**

**Ans.** Deepfakes are realistic but fake videos or images that are created by using Generative Adversarial Networks (GANs) to alter faces or voices, often used in entertainment and digital storytelling.

**16. Why is Python suitable for AI projects?**

**Ans.** Python has prebuilt libraries like NumPy, Scipy, and PyBrain, thus making it efficient for scientific computation, advanced computing, and machine learning.

**17. What are Python identifiers?**

**Ans.** Python identifiers are names that are used to identify variables, functions, classes, modules, or other objects in the code.

**18. What is the significance of indentation in Python?**

**Ans.** Indentation in Python denotes blocks of code and is critical for defining the structure of the code.

**Application-Based Long Questions****1. Describe the concept of a Decision Tree in AI. How does it work, and what are its advantages and limitations? Provide a detailed example of a decision tree application.**

**Ans.** Decision tree is a graphical representation which is used in AI to make decisions that are based on certain conditions. It consists of nodes representing decisions, branches representing outcomes of decisions, and leaves representing final decisions or classifications. The decision tree algorithm works by recursively splitting the data into subsets which are based on the most significant attributes.

**Advantages:**

Easy to understand and interpret.

Can handle both numerical and categorical data.

Requires little data preprocessing.

**Limitations:**

Prone to overfitting, especially with complex trees.





Can be biased if some classes dominate.  
Less effective with unstructured data.

**Example:** In a healthcare application, a decision tree can be used to diagnose patients as per their symptoms. For instance, a decision tree might start by asking whether the patient has a fever. If yes, the next question could be about the presence of a cough, followed by questions about symptoms like shortness of breath, fatigue, etc. Based on the answers, the tree guides the diagnosis towards conditions like flu, common cold, or COVID-19.

**2. Explain the process of Natural Language Processing (NLP) in AI. How is NLP used in chatbots, and what are the challenges that are associated with NLP?**

**Ans.** Natural Language Processing (NLP) is a branch of AI that focuses on the interaction between computers and humans through natural language. The process involves several steps:

**Tokenization:** Splitting text into smaller units like words or phrases.

**Parsing:** Analyzing the grammatical structure of the text.

**Semantic Analysis:** Understanding the meaning of the text.

**Sentiment Analysis:** Determining the emotional tone of the text.

**Chatbots:** NLP is used in chatbots to understand and respond to user queries. The chatbot processes the input text, extracts relevant information, and generates a coherent response. For instance, customer service chatbots handle queries about orders, returns, and troubleshooting by interpreting user messages and providing accurate answers.

**Challenges:**

**Ambiguity:** Words or phrases have multiple meanings.

**Context Understanding:** Requires understanding the context in which the words are used.

**Sarcasm and Idioms:** Difficult for AI to interpret non-literal language.

**Language Variability:** Differences in dialects, slang, and colloquialisms.

**3. Describe how AI can be leveraged in the field of finance for fraud detection. What are the benefits and potential risks of using AI in this context?**

**Ans.** AI can be leveraged in finance for fraud detection by analyzing large datasets to identify unusual patterns and behaviors that are indicative of fraudulent activities. Machine learning algorithms can process transaction data, user behavior, and other financial indicators in real-time to detect anomalies and flag the potential frauds.

**Benefits:**

**Efficiency:** AI can analyze vast amounts of data quickly and accurately.

**Accuracy:** Machine learning models improve over time, thereby leading to higher detection rates.

**Cost Savings:** Reduces the need for manual monitoring and investigation.



**Potential Risks:**

**False Positives:** Legitimate transactions may be flagged as fraudulent, thus causing inconvenience.

**Adaptability of Fraudsters:** Fraudsters may develop new tactics to bypass AI detection.

**Data Privacy:** Handling sensitive financial data raises concerns about data security and privacy.

**4. Write a program in python to find maximum among 3 numbers**

```
Ans. # Input three numbers
num1 = float(input("Enter first number: "))
num2 = float(input("Enter second number: "))
num3 = float(input("Enter third number: "))
# Determine the maximum number
if num1 >= num2 and num1 >= num3:
    max_num = num1
elif num2 >= num1 and num2 >= num3:
    max_num = num2
else:
    max_num = num3

# Print the maximum number
print("The maximum number is:", max_num)
```

**5. Write a python program to find the largest element in a list that is provided by the user.**

```
Ans. # Input a list of numbers
numbers = [1.2, 3.4, 2.2, 4.8, 5.6] # Example list of numbers
# Initialize the maximum element with the first element of the list
max_element = numbers[0]
# Iterate through the list to find the maximum element
for num in numbers:
    if num > max_element:
        max_element = num
# Print the maximum element
print("The largest element in the list is:", max_element)
```

