

Do not start attempting the test paper until you are asked to do so.

1374

ENROLLMENT NUMBER:

STUDENT NAME:

Class **9**

Maximum Marks : 100
Duration : 50 Minutes
Total Questions : 40

Test Paper Type

CC

1st
iAIO INTERNATIONAL
ARTIFICIAL INTELLIGENCE
OLYMPIAD
2025-2026

Instructions for the Candidates

1. For filling up information about yourself on the OMR sheet, you will be given additional ten minutes before the start of the examination.
2. Write your 12-digit iAIO Enrollment Number and your name on top of the Question Paper in the given space.
3. Do not forget to sign the OMR sheet. Also, write your Roll No. on the Question Paper Booklet, and do not take this home.
4. The Question Paper Booklet consists of 40 questions, divided into two sections.
5. Section-A: Artificial Intelligence (35 questions); Section-B: Scholar's Zone (5 questions).
6. Each question of Section-A carries 2.25 marks, and that of the Scholar's Zone carries 4.25 marks.
7. All the questions are compulsory, and there is no negative marking.
8. Use of a calculator or any other devices in the examination is strictly prohibited.
9. Choose only ONE OPTION as an answer.
10. BLUE/BLACK ball pen is preferred to darken the circle; however, in case of non-availability, an HB pencil can be used. Mark your choice of answer in the OMR sheet by darkening a circle, as shown below.

(A) (B) (C) (D)

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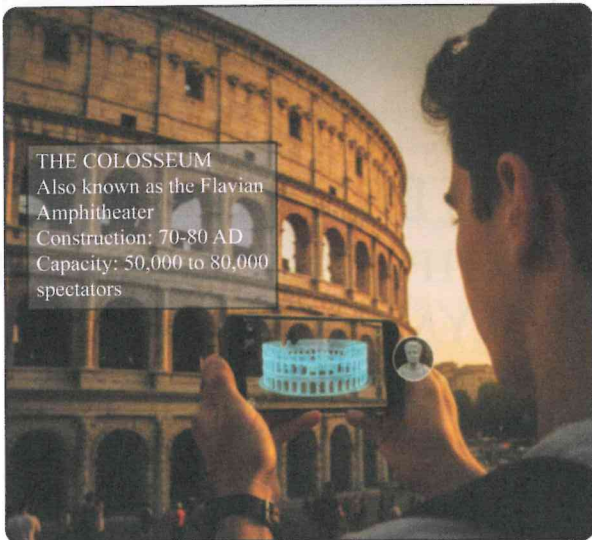
(A) (B) (C) (D)

Section–A (Artificial Intelligence)

1. What is the core goal of AI Ethics?
- A. Become more profitable than any other technology
 - B. Can pass for human in any conversation
 - C. Benefit humanity and do not cause harm
 - D. Achieve superhuman levels of intelligence

2. In which step do we combine both the content and style images to create the final result?
- A. Import Libraries
 - B. Preprocess Images
 - C. Stylise the Image
 - D. Display the Result

3. The image depicts a student using a smartphone application. What technology is most likely being demonstrated by the digital information appearing over the live camera view of the monument?



- A. Virtual Reality (VR)
 - B. Augmented Reality (AR)
 - C. Mixed Reality (MR)
 - D. Computer-Aided Design (CAD)
4. A data analyst examines a large dataset of school exam results. Before building any predictive model, they create summary statistics, generate scatter plots to inspect relationships between variables, and detect outliers. This entire process helps them understand the structure and key features of the data before formal analysis.
- Which stage of the data science process does this describe?

- A. Data Cleaning — because the analyst is removing incorrect data values
- B. Data Exploration — because the analyst is investigating patterns and relationships before modelling
- C. Data Modelling — because the analyst is testing predictive algorithms
- D. Data Collection — because the analyst is gathering information for analysis

5. What is the key strategic advantage of using AI to predict “accident hotspots” for emergency services?
- A. It allows emergency services to be proactive by allocating resources to high-risk areas
 - B. It completely prevents accidents from occurring in the identified hotspot locations
 - C. It provides paramedics with AI-powered tools to perform better medical procedures
 - D. It automatically dispatches drones to the scene of an accident instead of ambulances

6. The data cleaning step involves using `data.dropna()`. What is the direct result of this operation?
- A. All rows that have any missing values (like NaN) are removed from the DataFrame
 - B. The dataset is sorted based on the movie’s IMDb score in descending order
 - C. All columns that are not relevant to the analysis are completely discarded
 - D. The ‘genres’ column is simplified to include only the primary genre for each movie

7. What does ‘social impact of AI’ mean? Which scenario best shows a major social impact of AI needing ethical attention?
- A. AI diagnoses diseases, but risks patient privacy
 - B. Social media AI boosts engagement and profit
 - C. Speech AI aids disabled users but lacks language diversity
 - D. Factory AI increases efficiency and jobs

8. TA city uses AI to manage traffic in real time to reduce congestion and emissions. Which option best fits the “AI for Good” idea and highlights a key ethical issue?
- A. Focuses on speed; ethics not involved
 - B. Solves urban issues; must avoid bias and surveillance
 - C. Just a gadget, not part of AI for Good
 - D. Replaces jobs; main concern is unemployment

9. Python is widely used for AI because of several advantages. Which of the following is not a key reason Python is great for AI?
- Python's simple syntax allows beginners to focus on AI concepts without being confused by code.
 - Python includes powerful AI libraries like TensorFlow, Keras, and scikit-learn to build models quickly.
 - Python runs on multiple operating systems and has a strong community support for learning and troubleshooting.
 - Python automatically creates AI hardware and directly handles physical computations on devices for faster processing.

10. Statement: TensorFlow is best for creating simple tabular data tables and cleaning data.
- Which of the following is TRUE about this statement?
- The statement is true because TensorFlow helps make data tables easily.
 - The statement is false because TensorFlow is used to build AI models.
 - The statement is true because TensorFlow works mainly with spreadsheets.
 - The statement is false because TensorFlow is used for editing pictures.

11. If an AI system denies a person a loan, what does the principle of "Transparency and Explainability" require?
- The person has a right to know the reasons behind the AI's decision
 - The developer of the AI must be held legally responsible for the denial
 - The AI's decision must be beneficial to humanity as a whole
 - The personal data used to make the decision must be deleted immediately

12. A city is implementing AI to become smarter. AI is used to manage traffic lights based on real-time road conditions, predict accident hotspots to allocate ambulances efficiently, and monitor waste bins to avoid overflow. Which of the following statements is NOT true about AI in this smart city scenario?
- AI adjusts traffic lights automatically to reduce congestion
 - AI predicts where accidents might occur and allocates emergency resources
 - AI monitors bin levels to reduce overflow and fuel usage
 - AI builds new roads on its own without human help

13. A tech company is developing an AI that predicts whether users will enjoy a movie by analysing trailers, reviews, and facial expressions while watching. Which statement best explains why a deep learning approach is more suitable than traditional machine learning for this task?
- Deep learning models are slower but can analyse both visual and emotional data types to detect hidden patterns.
 - Traditional ML models are faster but can easily process videos and user emotions without feature selection.
 - Deep learning requires less data and works only with structured inputs such as movie genres and ratings.
 - Traditional ML automatically learns from unstructured data like audio and text without manual effort.

14. A city council is considering implementing an AI system to monitor public spaces for security, using facial recognition to identify individuals of interest. A junior data ethics advisor raises a concern about the responsible use of AI in this context, stating: "This system is a perfect example of responsible AI, as it uses advanced technology to make our city safer, and its accuracy is over 95%. Therefore, we should implement it immediately." What is the primary flaw in the advisor's reasoning regarding the responsible use of AI?
- Assumes high accuracy guarantees effective security, ignoring misidentifications or errors.
 - Ignores costs and whether the city's budget might be better used elsewhere.
 - Focuses on accuracy and safety but neglects privacy, bias, and ethical issues.
 - Omits the AI type (e.g., neural network), which is key to evaluating responsible use.

15. Match the variable with its correct type and explanation:

Variable	Type & Explanation
1. age = 12	p. Stores True/False values
2. name = "Ali"	q. Stores whole numbers
3. height = 1.68	r. Stores decimal numbers
4. is_hungry = False	s. Stores text in quotes

Choose the correct match:

- 1-s, 2-p, 3-q, 4-r
- 1-r, 2-q, 3-p, 4-s
- 1-q, 2-s, 3-r, 4-p
- 1-p, 2-r, 3-s, 4-q



16. An AI system analyses a satellite image and colours water bodies blue, forests green, and cities grey — treating each pixel based on what it represents. Which AI technique is being applied here?

- A. Object Detection — identifying one object at a time in an image
- B. Image Segmentation — labelling every pixel according to its category
- C. Image Classification — assigning a single label to the whole image
- D. Feature Extraction — highlighting important shapes and edges only

17. A quality inspection AI scans a batch of 200 smartphones. There are actually 20 defective phones, and the AI correctly identifies 15 of them as defective. What does this scenario tell us about the AI's recall?

- A. The AI correctly finds 5% of defective phones
- B. The AI correctly finds 10% of defective phones
- C. The AI correctly finds 75% of defective phones
- D. The AI correctly finds 150% of defective phones

18. A local government wants to reduce environmental damage in its region. They plan to use AI in three ways: monitoring farm fields to spray pesticides only when necessary, tracking endangered animals to prevent poaching, and predicting pollution levels in rivers and the air. Which of the following correctly matches the AI application to its environmental benefit?

- A. Smart Farming – alerts forest officers about poachers, Wildlife Protection – predicts crop yields, Pollution Monitoring – checks soil quality
- B. Smart Farming – predicts crop yields and alerts farmers about pests, Wildlife Protection – tracks endangered animals and alerts forest officers, Pollution Monitoring – predicts pollution levels for timely action
- C. Smart Farming – tracks endangered animals, Wildlife Protection – measures air and water quality, Pollution Monitoring – sprays pesticides automatically
- D. Smart Farming – cleans polluted water, Wildlife Protection – predicts crop harvest, Pollution Monitoring – monitors animal movements

19. Consider the following statements about Python in AI:

Statement 1: Tech giants like Google, Netflix, and Spotify use Python to develop AI systems.

Statement 2: These AI systems include content recommendations, music predictions, and speech recognition.

Which of the following is correct?

- A. Only Statement 1 is true; Statement 2 is false.
- B. Only Statement 2 is true; Statement 1 is false.
- C. Both Statement 1 and Statement 2 are false.
- D. Both Statement 1 and Statement 2 are true.

20. The following question presents an assertion followed by a reason. Read carefully and choose the correct answer.

Assertion (A): A Float can store both whole numbers and decimal numbers.

Reason (R): Float is only used for very large numbers.

- A. Both A and R are true
- B. A is true, but R is false
- C. A is false, but R is true
- D. Both A and R are false

21. Why is it important to normalise pixel values before giving them to the AI model?

- A. To change the image colour
- B. To reduce image size
- C. To help the AI model understand pixel patterns
- D. To convert the image into black and white

22. What is the correct sequence of operations inside a perceptron?

- A. Summation → Multiply by Weights → Activation Function → Output
- B. Activation Function → Summation → Multiply by Weights → Output
- C. Multiply by Weights → Summation → Activation Function → Output
- D. Summation → Activation Function → Multiply by Weights → Output

23. Which ethical pillar directly addresses the need to avoid creating or reinforcing unfair biases in AI systems?

- A. Accountability
- B. Transparency and Explainability
- C. Fairness and Inclusivity
- D. Human-Centred and Beneficial

24. Deepika is using a VR headset to study rainforest ecosystems. The simulation allows her to walk among trees, observe animal behaviour, interact with environmental elements like rainfall and sunlight, and see realistic plant growth over time.



Which statement BEST describes the type of experience and the key educational advantage of VR in this scenario?

- A. She is in a mixed-reality environment where real-world classroom elements are enhanced with virtual sounds and visuals, providing partial immersion.
- B. She is in an augmented reality setting, overlaying digital trees and animals onto her physical classroom, allowing comparison of real and virtual elements.
- C. She is fully immersed in a computer-generated VR simulation, enabling safe and interactive exploration of ecosystems.
- D. She is viewing a low-fidelity 2D simulation on a screen, which allows observation but lacks interactivity and spatial awareness.

25. What is the fundamental principle of the Learning-Based Approach in AI?

- A. The AI is programmed with every possible rule manually for all situations.
- B. The AI learns from experience and detects patterns in data to improve performance.
- C. The AI can only perform one specific pre-defined task without adaptation.
- D. The AI requires constant human intervention to make any decisions.

26. Siya: "Our school's sports AI can track the basketball even when the camera moves or zooms in. How does it manage that?"

Arun: "It probably finds special points like edges or corners in each frame, then matches them even if the view changes."

What concept is Arun describing?

- A. Scene Understanding — identifying the whole stadium environment and players' actions
- B. Feature Extraction — spotting and matching unique image details like corners and patterns
- C. Object Classification — sorting the footage into labelled video categories
- D. Neural Rendering — using AI layers to redraw the moving objects from scratch

-
27. The following question presents an assertion followed by a reason. Read carefully and choose the correct answer.

Assertion (A): Classification models can predict the language of a text.

Reason (R): Regression models predict category labels for emails and text.

- A. Both A and R are true
- B. A is true, but R is false
- C. A is false, but R is true
- D. Both A and R are false

-
28. Kajol wants to create an AI that predicts whether an email is “spam” or “not spam.” What type of supervised learning task should she use?

- A. Regression, it predicts a continuous value
- B. Classification, it predicts a category label
- C. Clustering, it finds hidden groups
- D. Reinforcement, it learns from rewards

-
29. Consider the AI concept of Vision described in the text: a neural network processes images to recognise patterns, enabling applications like facial recognition, security cameras, self-driving cars, and medical imaging.

Which statement best summarises the importance of Vision in AI?

- A. Vision allows AI to store images digitally and print them for human review later.
- B. Vision enables AI to perform complex calculations on numerical data without using visual input.
- C. Vision allows AI to interpret visual data, recognise patterns, and make informed decisions.
- D. Vision forces AI to generate random images automatically for testing and experiments.

-
30. When a developer faces a hard or unusual problem while building an AI model in Python, what helpful resources are available because so many people use Python?

- A. A high chance of finding help on websites like Stack Overflow
- B. A free phone call to expert engineers at Google
- C. A tool in Python that fixes the code by itself
- D. A promise that the same problem has already been solved and shared

-
31. A tech company wants to develop a smart assistant that can understand spoken commands, recognise images, and suggest personalised recommendations. The engineers are deciding which approach to use. They know that AI is the broader field of creating intelligent machines, and Deep Learning uses neural networks to learn patterns from large datasets.

Which statement best describes the role of Deep Learning in this scenario?

- A. Deep Learning and AI are unrelated, so the engineers must choose one over the other.
- B. AI is mostly theoretical here, while Deep Learning is the only practical method to build the assistant.
- C. Deep Learning is a specialised subset of AI that helps the assistant learn complex patterns from data.
- D. Deep Learning existed before AI, so it will guide all the AI design decisions.

-
32. Rohit writes a program:

```
score = "95"
```

```
passed = True
```

Which statement is correct?

- A. score should be a String because numbers in quotes are treated as text
- B. passed is incorrect because Boolean can store only numbers
- C. score is correctly an Integer because it represents marks
- D. passed should be a String for True/False values

-
33. Which library is the odd one out based on its primary function?

- A. NumPy
- B. Pandas
- C. Scikit-learn
- D. Keras

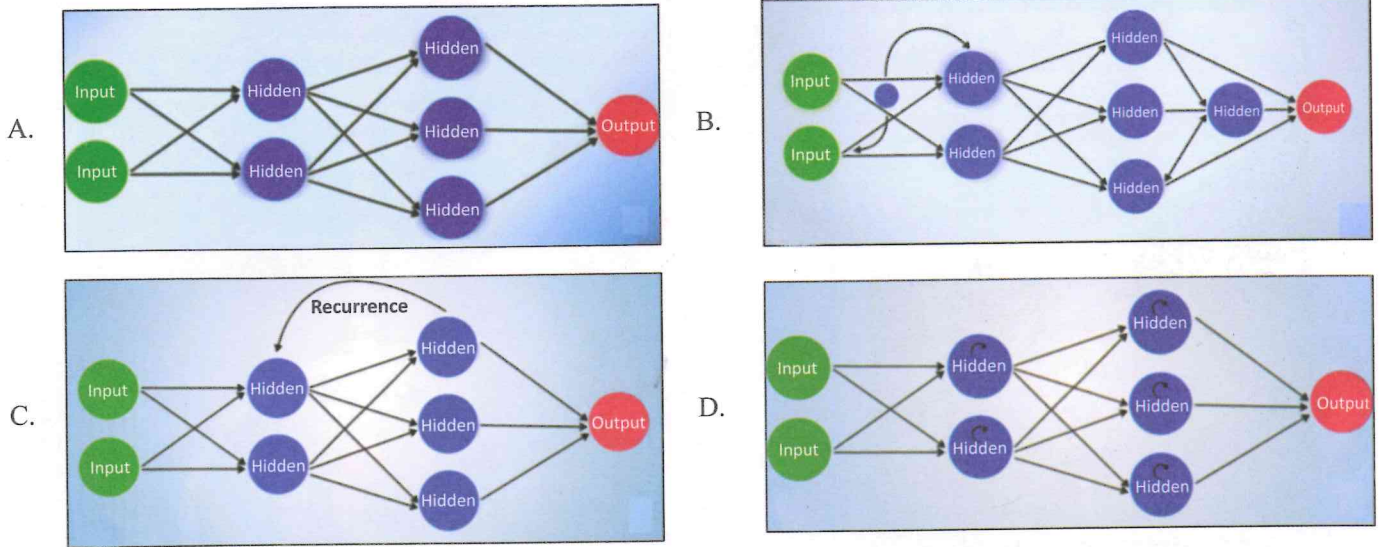
-
34. What do all three applications (security, healthcare and transport) have in common?

- A. They all reduce the cost of computers
- B. They use Computer Vision to understand visual data
- C. They depend on the internet to work
- D. They require human supervision at all times

-
35. What is the fundamental principle of the Learning-Based Approach?

- A. The AI is programmed with every possible rule
- B. The AI learns from experience and data patterns
- C. The AI can only perform one specific task
- D. The AI requires constant human intervention

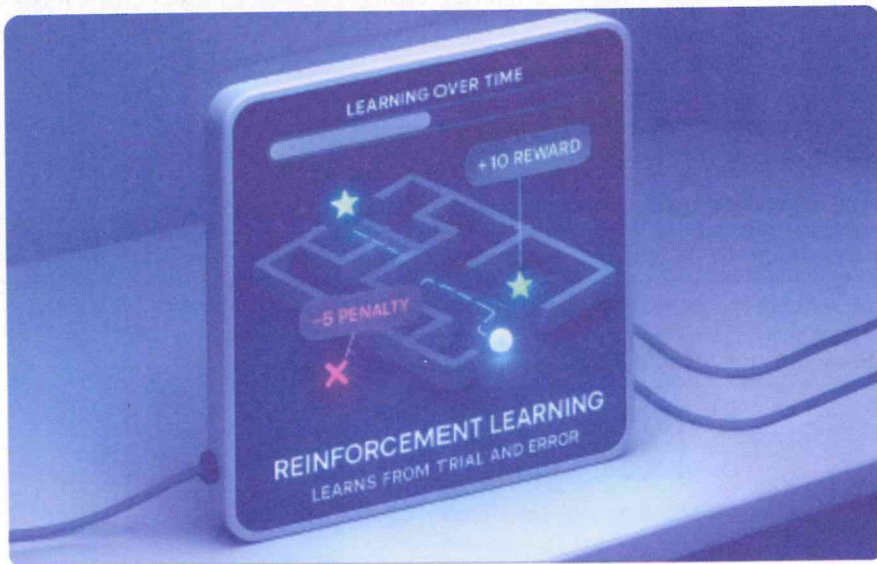
36. Which of the following diagrams correctly represents a Recurrent Neural Network (RNN) architecture?



37. Tina wants to convert her written podcast script into an audio narration automatically. She uploads her text to Suno AI, which generates a realistic voiceover in minutes, allowing her to focus on editing and publishing. Which aspect of AI is Tina using with Suno AI in this scenario?

- A. Suno AI edits images and converts them into animated videos for social media sharing.
- B. Suno AI analyses stock market trends and generates financial reports automatically.
- C. Suno AI predicts the weather using satellite data and sends alerts to users.
- D. Suno AI converts text scripts into high-quality audio narration using generative AI techniques.

38. The image displays a process where an agent navigates a maze, receiving rewards for reaching certain points and penalties for encountering obstacles, with a "Learning Over Time" progress bar.



What type of machine learning is depicted, and what is its fundamental principle as shown?

- A. Supervised Learning: Predicting outcomes based on a pre-labelled dataset.
- B. Reinforcement Learning: Learning by interacting with an environment to maximise cumulative rewards.
- C. Unsupervised Learning: Discovering patterns and structures within unlabeled data.
- D. Transfer Learning: Applying knowledge gained from solving one problem to a different but related problem.

39. Arjun, Roli, and Kabir are analysing the shown image, where only the white outlines of cars, road lanes, and barcode edges are visible.



Arjun says it removes colour but keeps outlines, Roli claims it's "Feature Extraction," and Kabir corrects Roli by saying it analyses brightness changes. Based on the image, which student is correct, and what additional step does this process support?

- A. Only Arjun – Correct, because it identifies objects but ignores edges and brightness information.
- B. Only Roli – Correct, because it extracts features like textures and shapes without focusing on outlines.
- C. Only Kabir – Correct, because it detects object outlines, analyses brightness changes, and aids further image processing.
- D. All are right– Because edges, outlines, and brightness are considered the same process.

40. Match the AI evaluation metric in Column I with its description in Column II.

Column A (Metric)	Column B (Description)
1. Accuracy	P. Balances precision and recall into a single fair evaluation number
2. Precision	Q. Measures how often the AI makes correct predictions overall
3. Recall	R. Shows how reliable the AI is when predicting a positive case
4. F1 Score	S. Focuses on identifying all actual positive cases without missing any

- A. 1-S, 2-P, 3-Q, 4-R
- B. 1-Q, 2-R, 3-P, 4-S
- C. 1-Q, 2-R, 3-S, 4-P
- D. 1-S, 2-P, 3-R, 4-Q

