

CBSE CLASS X

# Artificial Intelligence (417)

## QUESTION PAPER

From previous CBSE Board Exam questions

Code: AJEPEQ

Questions: 34

Maximum Marks: 65

Generated: 2026-06-21 02:53

### SELECTIONS USED

|                    |                                                         |
|--------------------|---------------------------------------------------------|
| Source             | Previous-year board                                     |
| Subject            | Artificial Intelligence                                 |
| Lessons            | Revisiting AI Project Cycle & Ethical Frameworks for AI |
| Year               | 2022-2026                                               |
| Questions selected | 34                                                      |

Composition — Types: 22 MCQ · 8 Long · 7 Short · 1 Assertion–reason · 1 fill\_in\_blank

#### Q1. § Types of Ethical Frameworks

[2]

Explain the difference between sector-based and value-based ethical frameworks with one example of each.

Previously asked in: 2026 104 Q11

♦ Revisiting AI Project Cycle & Ethical Frameworks for AI

1.3 Ethical Frameworks for AI

#### Q2. § Bioethics

[1]

Assertion (A) : Bioethics is an example of a Value-based Framework for AI.

Reason (R) : Bioethics deals with ethical issues related to health, medicine, and biological sciences.

- (A) Both (A) and (R) are true and (R) is the correct explanation of (A).
- (B) Both (A) and (R) are true, but (R) is not the correct explanation of (A).
- (C) (A) is true, but (R) is false.
- (D) (A) is false, but (R) is true.

Previously asked in: 2026 104 Q4 (ii)

♦ Revisiting AI Project Cycle & Ethical Frameworks for AI

1.3 Ethical Frameworks for AI

#### Q3. § Unit Overview § 1.3: Ethical Frameworks for AI § Reflection Time

[1]

As AI is essentially being used as a decision making / influencing tool, we need to ensure that AI makes morally acceptable recommendations. Which of the following is a key factor that can knowingly or unknowingly influences our decision-making while designing an AI model ?

- (A) Intuition and Values
- (B) Algorithm efficiency
- (C) Data storage capacity
- (D) Processing speed

Previously asked in: 2026 104 Q3 (iv)

♦ Revisiting AI Project Cycle & Ethical Frameworks for AI

1.3 Ethical Frameworks for AI

Q4. § Unit Overview § Test Yourself

[1]

Which stage of the AI Project Cycle involves testing the model on newly fetched data ?

- (A) Data Exploration
- (B) Modelling
- (C) Evaluation
- (D) Deployment

Previously asked in: 2026 104 Q2 (vi)

♦ Revisiting AI Project Cycle &amp; Ethical Frameworks for AI

1.1 AI Project Cycle

Q5. § 1.3: Ethical Frameworks for AI § Types of Ethical Frameworks

[1]

Ethical frameworks are primarily designed to:

- (A) Increase the efficiency of AI algorithms.
- (B) Ensure that choices made do not cause unintended harm.
- (C) Reduce the cost of AI development.
- (D) Speed up the AI project cycle.

Previously asked in: 2026 104 Q2 (iii)

♦ Revisiting AI Project Cycle &amp; Ethical Frameworks for AI

1.3 Ethical Frameworks for AI

Q6. § Test Yourself

[4]

With respect to scoping a problem in AI Project Cycle, explain 4 Ws Problem Canvas in detail.

Previously asked in: 2025 104/S Q17

♦ Revisiting AI Project Cycle &amp; Ethical Frameworks for AI

1.1 AI Project Cycle

Q7. § Unit Overview § Case Study § Reflection Time

[1]

Which of the following statements is true about AI Bias?

- (A) It is always negative.
- (B) It leads to overfitting of training data.
- (C) It can result in unfair and discriminatory outcomes.
- (D) A machine can have biases of its own.

Previously asked in: 2025 104/S Q5 (iv)

♦ Revisiting AI Project Cycle &amp; Ethical Frameworks for AI

1.3 Ethical Frameworks for AI

Q8. § Unit Overview

[1]

Which of the following is the second stage of an AI Project Cycle?

- (A) Problem Scoping
- (B) Evaluation
- (C) Data Acquisition
- (D) Data Exploration

Previously asked in: 2025 104/S Q3 (i)

♦ Revisiting AI Project Cycle &amp; Ethical Frameworks for AI

1.1 AI Project Cycle

Q9. § Test Yourself

[4]

What is the use of problem statement template with respect to 4Ws of problem scoping ? Draw a problem statement template depicting all key elements.

Previously asked in: 2024 104 Q18

♦ Revisiting AI Project Cycle &amp; Ethical Frameworks for AI

1.1 AI Project Cycle

**Q10.** § Unit Overview § Case Study § Reflection Time**[4]**

What do you understand by AI Bias and AI Access ? Give one example of each to support your answer.

Previously asked in: 2024 104 Q17

♦ Revisiting AI Project Cycle &amp; Ethical Frameworks for AI

1.3 Ethical Frameworks for AI

**Q11.** § Unit Overview § Test Yourself § Reflection Time**[2]**

Define the following with respect to AI project cycle :

(i) Data Exploration

(ii) Data Features

Previously asked in: 2024 104 Q12

♦ Revisiting AI Project Cycle &amp; Ethical Frameworks for AI

1.1 AI Project Cycle

**Q12.** § Test Yourself § Reflection Time § Case-Based Questions**[1]**

Statement 1 : In "When" block of 4Ws canvas we find the stakeholders.

Statement 2 : Stakeholders are the people who face a particular problem and would be benefitted with the solution.

(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.

(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.

Previously asked in: 2024 104 Q2 (iii)

♦ Revisiting AI Project Cycle &amp; Ethical Frameworks for AI

1.1 AI Project Cycle

**Q13.** § Test Yourself**[1]**

The 4 W's Problem Canvas helps in identifying the key elements related to the given problem. Which of the following is NOT one of the blocks of the Problem Canvas ?

(a) When

(b) Where

(c) What

(d) Why

Previously asked in: 2024 104 Q5 (v)

♦ Revisiting AI Project Cycle &amp; Ethical Frameworks for AI

1.1 AI Project Cycle

**Q14.** § Unit Overview § Test Yourself § Reflection Time**[1]**

In the AI project cycle, which of the following represents the correct order of steps ?

(a) Data Exploration, Problem Scoping, Modelling, Evaluation, Data Acquisition.

(b) Problem Scoping, Data Acquisition, Data Exploration, Modelling, Evaluation.

(c) Modelling, Data Acquisition, Evaluation, Problem Scoping, Data Exploration.

(d) Data Acquisition, Data Exploration, Problem Scoping, Modelling, Evaluation.

Previously asked in: 2024 104 Q3 (ii)

♦ Revisiting AI Project Cycle &amp; Ethical Frameworks for AI

1.1 AI Project Cycle

**Q15.** § Unit Overview § Test Yourself § Reflection Time**[1]**

Which of the following contributes to the efficiency of an AI project ?

- (a) High Model Complexity
- (b) Relevant and Authentic Training Data
- (c) Minimal Preprocessing
- (d) Limited Hardware Resources

Previously asked in: 2024 104 Q2 (i)

♦ Revisiting AI Project Cycle &amp; Ethical Frameworks for AI

1.1 AI Project Cycle

**Q16.** § Unit Overview § 1.2: Introduction to AI Domains § Case Study**[2]**

Explain any one example of AI bias.

Previously asked in: 2023 104 Q11

♦ Revisiting AI Project Cycle &amp; Ethical Frameworks for AI

1.3 Ethical Frameworks for AI

**Q17.****[1]**

4Ws Problem Canvas is a part of:

- (a) Problem Scoping
- (b) Data Acquisition
- (c) Modelling
- (d) Evaluation

Previously asked in: 2023 104 Q5 (iv)

♦ Revisiting AI Project Cycle &amp; Ethical Frameworks for AI

1.1 AI Project Cycle

**Q18.** § Unit Overview § Case Study § Reflection Time**[1]**

Under \_\_\_\_\_, one looks at various parameters which affect the problem we wish to solve, as this would make many lives better.

Previously asked in: 2023 104 Q4 (v)

♦ Revisiting AI Project Cycle &amp; Ethical Frameworks for AI

1.1 AI Project Cycle

**Q19.** § 1.2: Introduction to AI Domains**[1]**

During Data Acquisition, feeding previous data into the machine is called:

- (a) Training Data
- (b) Predicting Data
- (c) Testing Data
- (d) Evaluating Data

Previously asked in: 2023 104 Q2 (iv)

♦ Revisiting AI Project Cycle &amp; Ethical Frameworks for AI

1.1 AI Project Cycle

**Q20.** § Unit Overview § 1.2: Introduction to AI Domains § Case Study**[1]**

Whenever we want an AI project to be able to predict an output, we need to \_\_\_\_\_.

- (A) first test it using the data.
- (B) first train it using the data.
- (C) Both (A) and (B)
- (D) Neither (A) nor (B)

Previously asked in: 2024 104 Q2 (iv)

♦ Revisiting AI Project Cycle &amp; Ethical Frameworks for AI

1.1 AI Project Cycle

**Q21.** § 1.2: Introduction to AI Domains § Test Yourself**[2]**

Differentiate between Data Acquisition and Data Exploration.

Previously asked in: 2025 104/S Q13

♦ Revisiting AI Project Cycle &amp; Ethical Frameworks for AI

Data Acquisition vs Data Exploration

**Q22.** § 1.2: Introduction to AI Domains § Test Yourself § Reflection Time**[2]**

What role does data play in AI based applications ? Name any two sources of online data collection for building any AI based application.

Previously asked in: 2024 104 Q15

♦ Revisiting AI Project Cycle &amp; Ethical Frameworks for AI

1.1 AI Project Cycle

Sources of Online Data Collection for AI Applications

**Q23.** § Unit Overview § Test Yourself § Reflection Time**[4]**

What is the significance of AI project cycle? Also explain in detail about how Data Acquisition is different from data exploration.

Previously asked in: 2023 104 Q18

♦ Revisiting AI Project Cycle &amp; Ethical Frameworks for AI

1.1 AI Project Cycle

Data Acquisition vs Data Exploration

**Q24.** § Unit Overview**[2]**

What is the purpose of Evaluation stage of AI project cycle? Discuss briefly.

Previously asked in: 2022 104 Q14

♦ Revisiting AI Project Cycle &amp; Ethical Frameworks for AI

1.1 AI Project Cycle

3.1 Importance of Model Evaluation

**Q25.** § 1.2: Introduction to AI Domains**[1]**

Raghav can turn on and off any appliance remotely using an internet enabled device. This is an example of \_\_\_\_\_.

- (A) Artificial Intelligence (AI)
- (B) Internet of Things (IoT)
- (C) Computer Vision (CV)
- (D) Deep Learning (DL)

Previously asked in: 2024 104 Q4 (vi)

♦ Revisiting AI Project Cycle &amp; Ethical Frameworks for AI

Internet of Things (IoT) – Remote Control of Appliances via Internet-Enabled Devices

**Q26.****[2]**

Differentiate between Kinesthetic Intelligence and Spatial Visual Intelligence.

Previously asked in: 2025 104/S Q11

♦ Revisiting AI Project Cycle &amp; Ethical Frameworks for AI

Kinesthetic Intelligence vs Spatial Visual Intelligence

**Q27.** § Unit Overview § Test Yourself § Reflection Time**[4]**

Consider the following scenarios and identify which AI domain would be most appropriate for each, with justification:

- (A) An AI based education platform needs to translate to English language and analyze thousands of student essays to provide instant feedback on grammar, content quality and writing style. [2]
- (B) An AI based application installed on a busy crossing in a metropolitan city scans all vehicles driving through that crossing during peak traffic hours and categorizes them into four wheelers and two wheelers. [2]

Previously asked in: 2026 104 Q18

♦ Revisiting AI Project Cycle &amp; Ethical Frameworks for AI

1.2 Introduction to AI Domains

6.2 Applications of NLP

Computer Vision Applications – Object Detection and Classification

**Q28.** § 1.2: Introduction to AI Domains**[1]**

Which AI domain would be most suitable for developing a price comparison website ?

- (A) Computer Vision
- (B) Natural Language Processing
- (C) Statistical Data
- (D) Robotics

Previously asked in: 2026 104 Q5 (i)

♦ Revisiting AI Project Cycle &amp; Ethical Frameworks for AI

1.2 Introduction to AI Domains

**Q29.** § 1.2: Introduction to AI Domains § Test Yourself § Reflection Time**[4]**

Categorise the following examples under the given three AI domains — Data Science, NLP and Computer Vision with justification :

- (a) Recommendation Websites
- (b) Voice-based Virtual Assistants
- (c) Spam Filters
- (d) Airline Route Planning

Previously asked in: 2025 104/S Q20

♦ Revisiting AI Project Cycle &amp; Ethical Frameworks for AI

1.2 Introduction to AI Domains

6.2 Applications of NLP

**Q30.** § Unit Overview § Test Yourself § Reflection Time**[1]**

\_\_\_\_\_ is the best example of Robotics and AI (Artificial Intelligence) working together.

- (A) Telephones
- (B) Self-driving cars
- (C) Bulb
- (D) Printing Machine

Previously asked in: 2025 104/S Q3 (iii)

♦ Revisiting AI Project Cycle &amp; Ethical Frameworks for AI

1.2 Introduction to AI Domains

**Q31.** § 1.2: Introduction to AI Domains § Case Study § Reflection Time**[1]**

Which AI application involves analysing large sets of data to extract meaningful insights for decision-making?

- (A) Computer Vision
- (B) Robotics
- (C) Natural Language Processing (NLP)
- (D) Data Science

Previously asked in: 2025 104/S Q2 (ii)

♦ Revisiting AI Project Cycle &amp; Ethical Frameworks for AI

1.2 Introduction to AI Domains

**Q32.** § Unit Overview § Reflection Time**[1]**

Identify the logo of an application of AI given below. It helps us to navigate to places.

Previously asked in: 2024 104 Q3 (i)

♦ Revisiting AI Project Cycle &amp; Ethical Frameworks for AI

1.2 Introduction to AI Domains

**Q33.****[1]**

Platforms such as Spotify, Facebook, Instagram, Amazon, Netflix etc. shows recommendation on the basis of what you like. Which is the technology behind this ?

- (A) Human Intelligence
- (B) Platform Intelligence
- (C) Artificial Intelligence
- (D) Application Intelligence

Previously asked in: 2024 104 Q2 (ii)

♦ Revisiting AI Project Cycle & Ethical Frameworks for AI

1.2 Introduction to AI Domains

**Q34.**

§ Unit Overview

§ Reflection Time

**[4]**

Give any four examples of applications of AI that we see around us.

Previously asked in: 2024 104 Q18

♦ Revisiting AI Project Cycle & Ethical Frameworks for AI

1.2 Introduction to AI Domains

**Q35.**

§ Unit Overview

§ Reflection Time

**[4]**

Will it be valid to say that not all the devices which are termed as "smart" are AI-enabled? Justify this statement. Explain any two examples from the daily life which are commonly misunderstood as AI.

Previously asked in: 2023 104 Q20

♦ Revisiting AI Project Cycle & Ethical Frameworks for AI

1.2 Introduction to AI Domains

2.1 Revisiting AI, ML, DL

**Q36.**

§ 1.2: Introduction to AI Domains

**[1]**

Identify the incorrect statements from the following:

- (i) AI models can be broadly categorized into four domains.
- (ii) Data sciences is one of the domain of AI model.
- (iii) Price comparison websites are examples of data science.
- (iv) The information extracted through data science can be used to make decision about it.

- (a) Only (iv)
- (b) (iii) and (iv)
- (c) Only (i)
- (d) (ii) and (iii)

Previously asked in: 2023 104 Q2 (iii)

♦ Revisiting AI Project Cycle & Ethical Frameworks for AI

1.2 Introduction to AI Domains

**Q37.**

§ Unit Overview

§ 1.2: Introduction to AI Domains

**[1]**

Which of the following represent a machine that is smart but not considered Artificial Intelligence (AI) enabled ?

- (a) A robotic vacuum cleaner that can navigate and clean floors autonomously.
- (b) A chatbot that engages in natural language conversations and answers questions.
- (c) A smartphone with facial recognition for unlocking the device.
- (d) A digital alarm clock that rings at a set time every morning.

Previously asked in: 2024 104 Q2 (iii)

♦ Revisiting AI Project Cycle & Ethical Frameworks for AI

1.2 Introduction to AI Domains

**Q38.** § 1.2: Introduction to AI Domains**[1]**

Which of the following represents an example of a recommendation system ?

- (a) An online clothing store that offers a wide variety of clothing options.
- (b) A search engine that retrieves relevant web pages based on user queries.
- (c) An e-commerce website that displays customer reviews and ratings for products.
- (d) A music streaming platform that suggests songs and playlists based on user listening history.

Previously asked in: 2024 104 Q4 (iv)

♦ Revisiting AI Project Cycle & Ethical Frameworks for AI

1.2 Introduction to AI Domains

Collaborative Filtering / Recommendation Systems

**Q39.** § Unit Overview § 1.2: Introduction to AI Domains**[1]**

\_\_\_\_\_ enables computers to mimic human intelligence.

- (A) Cloud Computing
- (B) Artificial Intelligence
- (C) Web Development
- (D) Data Entry

Previously asked in: 2025 104/S Q2 (i)

♦ Revisiting AI Project Cycle & Ethical Frameworks for AI

1.2 Introduction to AI Domains

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## CBSE CLASS X

## Artificial Intelligence (417)

## ANSWER KEY

From previous CBSE Board Exam questions

Code: AJEPEQ

Questions: 34

Maximum Marks: 65

Generated: 2026-06-21 02:53

Q1. § Types of Ethical Frameworks

[2]

Explain the difference between sector-based and value-based ethical frameworks with one example of each.

Previously asked in: 2026 104 Q11

♦ Revisiting AI Project Cycle &amp; Ethical Frameworks for AI

1.3 Ethical Frameworks for AI

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## Model Answer

**Sector-based frameworks** are tailored to specific industries or domains.*Example: Bioethics* in healthcare addresses patient privacy, data security, and ethical use of AI in medical decision-making.**Value-based frameworks** focus on fundamental ethical principles guiding decision-making.*Example: Rights-based framework* ensures AI systems respect human rights and do not discriminate against any group.*Source: Types of Ethical Frameworks, Chapter 1*

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## Explanation

- The examiner expects **one clear definition + one example** for each type — that's where both marks lie.
- Don't just name the framework as the example; briefly state what it does, as shown above.
- Bioethics is the go-to example for sector-based; for value-based, any one of the three sub-types (rights, utility, virtue) with a brief description is acceptable.
- Avoid writing lengthy paragraphs — two tight points earn full marks here.

## Q2. § Bioethics

[1]

Assertion (A) : Bioethics is an example of a Value-based Framework for AI.

Reason (R) : Bioethics deals with ethical issues related to health, medicine, and biological sciences.

- (A) Both (A) and (R) are true and (R) is the correct explanation of (A).
- (B) Both (A) and (R) are true, but (R) is not the correct explanation of (A).
- (C) (A) is true, but (R) is false.
- (D) (A) is false, but (R) is true.

Previously asked in: 2026 104 Q4 (ii)

♦ Revisiting AI Project Cycle &amp; Ethical Frameworks for AI

1.3 Ethical Frameworks for AI

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**Model Answer**

**(D) (A) is false, but (R) is true.**

Bioethics is a **Sector-based** framework (specific to healthcare), not a Value-based framework. However, (R) is true — Bioethics does deal with ethical issues related to health, medicine, and biological sciences.

**Explanation**

The source passage clearly classifies Bioethics under **Sector-based Frameworks**, not Value-based. Value-based frameworks include Rights-based, Utility-based, and Virtue-based. The Reason (R) is factually correct as per the passage. Examiners expect students to recall this classification precisely — it is a common trick question.

## Q3. § Unit Overview § 1.3: Ethical Frameworks for AI § Reflection Time

[1]

As AI is essentially being used as a decision making / influencing tool, we need to ensure that AI makes morally acceptable recommendations. Which of the following is a key factor that can knowingly or unknowingly influences our decision-making while designing an AI model ?

- (A) Intuition and Values
- (B) Algorithm efficiency
- (C) Data storage capacity
- (D) Processing speed

Previously asked in: 2026 104 Q3 (iv)

♦ Revisiting AI Project Cycle &amp; Ethical Frameworks for AI

1.3 Ethical Frameworks for AI

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**Model Answer**

**(A) Intuition and Values**

Intuition and values knowingly or unknowingly influence our decision-making while designing an AI model, which is why ethical frameworks are needed to ensure AI makes morally acceptable recommendations.

**Explanation**

The chapter explicitly states that factors like **intuition and values** influence decision-making (Reflection Time Q.3). Algorithm efficiency, data storage, and processing speed are technical parameters, not moral/ethical influencers. Examiners expect students to link this to the need for ethical frameworks in AI design.

## Q4. § Unit Overview § Test Yourself

[1]

Which stage of the AI Project Cycle involves testing the model on newly fetched data ?

- (A) Data Exploration
- (B) Modelling
- (C) Evaluation
- (D) Deployment

Previously asked in: 2026 104 Q2 (vi)

♦ Revisiting AI Project Cycle &amp; Ethical Frameworks for AI

1.1 AI Project Cycle

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**Model Answer****(C) Evaluation**

In the AI Project Cycle, the **Evaluation** stage involves testing the model on newly fetched data to assess its performance and improve it.

**Explanation**

The source passage (section 1.1) explicitly states: *"you now need to test your model on some newly fetched data. The results will help you in evaluating your model and improving it."* This directly maps to the **Evaluation** stage. Students often confuse this with Modelling (which is about building/selecting the model) or Deployment (which comes after evaluation). Remember the sequence: Modelling → **Evaluation** → Deployment.

## Q5. § 1.3: Ethical Frameworks for AI § Types of Ethical Frameworks

[1]

Ethical frameworks are primarily designed to:

- (A) Increase the efficiency of AI algorithms.
- (B) Ensure that choices made do not cause unintended harm.
- (C) Reduce the cost of AI development.
- (D) Speed up the AI project cycle.

Previously asked in: 2026 104 Q2 (iii)

♦ Revisiting AI Project Cycle &amp; Ethical Frameworks for AI

1.3 Ethical Frameworks for AI

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**Model Answer****(B) Ensure that choices made do not cause unintended harm.**

Ethical frameworks are designed to help ensure that the choices we make do not cause unintended harm, guiding morally acceptable decision-making.

Source: Chapter 1, Section 1.3 – Ethical Frameworks for AI

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**Explanation**

The textbook explicitly defines ethical frameworks as "frameworks which help us ensure that the choices we make do not cause unintended harm." Options A, C, and D relate to efficiency, cost, and speed — these are technical/business goals, not ethical ones. Examiners expect direct recall of the definition from the source.

Q6. § Test Yourself

[4]

With respect to scoping a problem in AI Project Cycle, explain 4 Ws Problem Canvas in detail.

Previously asked in: 2025 104/S Q17

♦ Revisiting AI Project Cycle &amp; Ethical Frameworks for AI

1.1 AI Project Cycle

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### Model Answer

The **4 Ws Problem Canvas** is a tool used during the **Problem Scoping** stage of the AI Project Cycle to clearly define a problem. It consists of four questions:

1. **What** – What is the problem to be solved? This defines the aim and objective of the project.
2. **Who** – Who are the stakeholders affected by the problem? This identifies the target users and beneficiaries.
3. **Where** – Where does the problem occur? This defines the context or domain (e.g., healthcare, agriculture).
4. **Why** – Why is it important to solve this problem? This establishes the purpose and impact of the AI solution.

Together, these four questions help set a clear, structured problem statement before moving to data acquisition.

Source: Chapter 1, Section 1.1 – AI Project Cycle

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### Explanation

- The examiner expects all **4 Ws named and explained** — one point each  $\approx$  1 mark each.
- Keep each point to one sentence; do not over-elaborate.
- The passage directly states that Problem Scoping is about "setting the goal" and "looking at various parameters" — link your answer to this.
- Do **not** confuse 4 Ws with the full 6 stages of the AI Project Cycle; the question is specifically about the canvas within Problem Scoping.

Q7. § Unit Overview § Case Study § Reflection Time

[1]

Which of the following statements is true about AI Bias?

- (A) It is always negative.
- (B) It leads to overfitting of training data.
- (C) It can result in unfair and discriminatory outcomes.
- (D) A machine can have biases of its own.

Previously asked in: 2025 104/S Q5 (iv)

♦ Revisiting AI Project Cycle &amp; Ethical Frameworks for AI

1.3 Ethical Frameworks for AI

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**Model Answer****(C) It can result in unfair and discriminatory outcomes.**

AI bias occurs when training data or algorithms reflect existing prejudices, leading to unfair and discriminatory outcomes against certain groups.

**Explanation**

- Option (A) is incorrect — bias is not *always* negative; sometimes it simplifies models usefully, but harmful bias is the concern.
- Option (B) confuses bias with overfitting — two separate concepts.
- Option (D) is incorrect — machines reflect human-introduced bias; they do not generate independent biases of their own.
- The case study in the chapter clearly illustrates how an algorithm trained on skewed healthcare data led to discriminatory outcomes for patients from the western region, confirming **(C)** as correct.

Q8. § Unit Overview

[1]

Which of the following is the second stage of an AI Project Cycle?

- (A) Problem Scoping
- (B) Evaluation
- (C) Data Acquisition
- (D) Data Exploration

Previously asked in: 2025 104/S Q3 (i)

♦ Revisiting AI Project Cycle &amp; Ethical Frameworks for AI

1.1 AI Project Cycle

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**Model Answer****(C) Data Acquisition**

The second stage of the AI Project Cycle is **Data Acquisition**, which follows Problem Scoping (1st stage).

**Explanation**

The AI Project Cycle has 6 stages in order: Problem Scoping → Data Acquisition → Data Exploration → Modelling → Evaluation → Deployment. The source passage confirms this sequence. Students must memorise this order as MCQs and short-answer questions frequently test it.

## Q9. § Test Yourself

[4]

What is the use of problem statement template with respect to 4Ws of problem scoping ? Draw a problem statement template depicting all key elements.

Previously asked in: 2024 104 Q18

♦ Revisiting AI Project Cycle &amp; Ethical Frameworks for AI

1.1 AI Project Cycle

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**Model Answer****Use of Problem Statement Template (4Ws of Problem Scoping):**

A problem statement template helps clearly define and scope a problem by addressing four key questions — **Who, What, Where, and Why**. It ensures that all relevant aspects of the problem are considered before developing an AI solution, providing a structured and focused starting point for the AI Project Cycle.

**Problem Statement Template:**

| Key Element | Description                                                 |
|-------------|-------------------------------------------------------------|
| Who         | Who is affected by the problem? (Target users/stakeholders) |
| What        | What is the problem? (Core issue to be solved)              |
| Where       | Where does the problem occur? (Context/environment)         |
| Why         | Why does it matter? (Impact/importance of solving it)       |

By filling in all four elements, the problem statement becomes clear, specific, and actionable, guiding the subsequent stages of the AI Project Cycle effectively.

Source: Chapter 1 — AI Project Cycle, Problem Scoping

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**Explanation**

- The examiner expects you to **name and explain the 4Ws** and present the **template as a table or labelled diagram**.
- Always link the template's purpose to *problem scoping* — it helps set the goal of the AI project.
- Avoid writing lengthy paragraphs; a neat table earns full marks for the diagram part.
- The 4Ws are standard: **Who, What, Where, Why** — memorise these exactly.

Q10. § Unit Overview § Case Study § Reflection Time

[4]

What do you understand by AI Bias and AI Access ? Give one example of each to support your answer.

Previously asked in: 2024 104 Q17

♦ Revisiting AI Project Cycle &amp; Ethical Frameworks for AI

1.3 Ethical Frameworks for AI

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### Model Answer

**AI Bias** refers to unfair or prejudiced outcomes produced by an AI system, usually due to biased training data or flawed algorithm design.

**Example:** In the case study, a healthcare algorithm was trained on healthcare expense data instead of actual illness data. Since less money was spent on patients from the western region, the algorithm wrongly rated them as lower risk, even when they were more severely ill — showing clear bias against a particular group.

**AI Access** refers to unequal availability of AI tools, benefits, or technologies to different sections of society.

**Example:** If an advanced AI-based medical diagnosis tool is only available in urban hospitals and not in rural areas, people in remote regions are denied equal access to AI-driven healthcare benefits.

---

### Explanation

- Examiners expect a **clear definition + relevant example** for each term — that's roughly 1 mark definition + 1 mark example per concept.
- The bias example is directly drawn from the chapter's case study — always use textbook examples when available.
- For AI Access, the textbook doesn't provide a direct example, so a logical real-world example consistent with the theme (equitable access to AI) is acceptable.
- Keep definitions crisp; avoid over-explaining.

Q11. § Unit Overview § Test Yourself § Reflection Time

[2]

Define the following with respect to AI project cycle :

- (i) Data Exploration
- (ii) Data Features

Previously asked in: 2024 104 Q12

♦ Revisiting AI Project Cycle &amp; Ethical Frameworks for AI

1.1 AI Project Cycle

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**Model Answer****(i) Data Exploration:**

It is the stage in the AI Project Cycle where the collected data is visually represented using graphs, charts, databases, maps, etc., to identify and interpret the patterns present in the data.

**(ii) Data Features:**

Data features are the specific attributes or characteristics of the data that are relevant to the problem being solved. They are the parameters selected from the dataset to train the AI model.

*Source: Chapter 1, Section 1.1 – AI Project Cycle*

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**Explanation**

- The question has two sub-parts worth 1 mark each, so keep each definition to 1–2 lines.
- **Data Exploration** links to the step where raw acquired data is visualised to find patterns — mention visualisation tools (graphs, charts, etc.) for full marks.
- **Data Features** relates to selecting relevant attributes/parameters from data — examiners expect the word "attributes" or "parameters."
- Both definitions must be in the context of the AI Project Cycle, not general ML/statistics definitions.

**Q12.** § Test Yourself § Reflection Time § Case-Based Questions

[1]

Statement 1 : In "When" block of 4Ws canvas we find the stakeholders.

Statement 2 : Stakeholders are the people who face a particular problem and would be benefitted with the solution.

- (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.
- (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.

Previously asked in: 2024 104 Q2 (iii)

♦ Revisiting AI Project Cycle &amp; Ethical Frameworks for AI

1.1 AI Project Cycle

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**Model Answer**

**(D) Statement 2 is correct but Statement 1 is incorrect.**

In the 4Ws canvas, **stakeholders are found in the "Who" block**, not the "When" block. Statement 2 is correct — stakeholders are indeed people who face the problem and benefit from the solution.

**Explanation**

The 4Ws canvas stands for **Who, What, Where, and When**. "Who" identifies the stakeholders (affected people/beneficiaries), "What" defines the problem, "Where" is the context, and "When" refers to the timing/frequency of the problem. Examiners expect students to clearly know which block contains which information. Statement 1 confuses "When" with "Who," making it incorrect.

**Q13.** § Test Yourself

[1]

The 4 W's Problem Canvas helps in identifying the key elements related to the given problem. Which of the following is NOT one of the blocks of the Problem Canvas ?

- (a) When  
(b) Where  
(c) What  
(d) Why

Previously asked in: 2024 104 Q5 (v)

♦ Revisiting AI Project Cycle &amp; Ethical Frameworks for AI

1.1 AI Project Cycle

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**Model Answer**

**(a) When**

The 4 W's Problem Canvas blocks are **Who, What, Where, and Why**. "When" is NOT one of the blocks.

**Explanation**

The 4 W's stand for Who, What, Where, and Why — used during Problem Scoping to define the problem clearly. Students often confuse "When" as one of the W's; remember, time/timeline is not a block of the Problem Canvas. The source passages are from Chapter 1 but the 4 W's concept is a standard part of the AI Project Cycle curriculum.

Q14. § Unit Overview § Test Yourself § Reflection Time

[1]

In the AI project cycle, which of the following represents the correct order of steps ?

- (a) Data Exploration, Problem Scoping, Modelling, Evaluation, Data Acquisition.
- (b) Problem Scoping, Data Acquisition, Data Exploration, Modelling, Evaluation.
- (c) Modelling, Data Acquisition, Evaluation, Problem Scoping, Data Exploration.
- (d) Data Acquisition, Data Exploration, Problem Scoping, Modelling, Evaluation.

Previously asked in: 2024 104 Q3 (ii)

♦ Revisiting AI Project Cycle &amp; Ethical Frameworks for AI

1.1 AI Project Cycle

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**Model Answer****(b) Problem Scoping, Data Acquisition, Data Exploration, Modelling, Evaluation.****Explanation**

The AI Project Cycle follows a fixed sequence: first the problem is defined (Problem Scoping), then data is collected (Data Acquisition), then patterns are studied (Data Exploration), then the model is built (Modelling), and finally the model is tested (Evaluation). The textbook explicitly lists these stages in this order. Option (b) matches exactly.

Q15. § Unit Overview § Test Yourself § Reflection Time

[1]

Which of the following contributes to the efficiency of an AI project ?

- (a) High Model Complexity
- (b) Relevant and Authentic Training Data
- (c) Minimal Preprocessing
- (d) Limited Hardware Resources

Previously asked in: 2024 104 Q2 (i)

♦ Revisiting AI Project Cycle &amp; Ethical Frameworks for AI

1.1 AI Project Cycle

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**Model Answer****(b) Relevant and Authentic Training Data**

Relevant and authentic training data ensures the AI model learns accurate patterns, leading to better performance and efficiency in an AI project.

**Explanation**

The AI Project Cycle (Section 1.1) clearly states that data must be collected from "**reliable and authentic sources**" as it forms the base of the project. Quality training data directly impacts model accuracy and efficiency. Options (a), (c), and (d) — high complexity, minimal preprocessing, and limited hardware — all reduce efficiency rather than improve it.

Q16. § Unit Overview § 1.2: Introduction to AI Domains § Case Study

[2]

Explain any one example of AI bias.

Previously asked in: 2023 104 Q11

♦ Revisiting AI Project Cycle &amp; Ethical Frameworks for AI

1.3 Ethical Frameworks for AI

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**Model Answer****Example of AI Bias — Healthcare Algorithm**

A company developed an AI algorithm to identify high-risk patients for better resource allocation. The algorithm was trained on **healthcare expense data** instead of actual illness data. Since less money was spent on patients from the western region, the algorithm underestimated their health risk, causing them to receive less care despite being more severely ill than patients from other regions.

Source: Case Study, Chapter 1

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**Explanation**

- Examiners look for: (1) a clear, specific example and (2) explanation of **why** the bias occurred — both needed for full 2 marks.
- The key cause here is **biased/proxy training data** (expenses used instead of actual health metrics), which led to unfair outcomes for one group.
- Avoid vague statements like "the data was wrong" — name the specific problem (wrong metric used for training).

Q17.

[1]

4Ws Problem Canvas is a part of:

- (a) Problem Scoping
- (b) Data Acquisition
- (c) Modelling
- (d) Evaluation

Previously asked in: 2023 104 Q5 (iv)

♦ Revisiting AI Project Cycle &amp; Ethical Frameworks for AI

1.1 AI Project Cycle

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**Model Answer****(a) Problem Scoping**

The 4Ws Problem Canvas is a tool used during the **Problem Scoping** stage of the AI Project Cycle to define and understand the problem statement.

**Explanation**

The 4Ws (What, Who, Where, Why) Problem Canvas helps outline the aim and objective of a project at the Problem Scoping stage. The source passage confirms Problem Scoping involves "defining the problem statement" to "understand the aim and objective of the project." Remember: Problem Scoping comes first in the AI Project Cycle, and the 4Ws canvas is its key framework tool.

Q18. § Unit Overview § Case Study § Reflection Time

[1]

Under \_\_\_\_\_, one looks at various parameters which affect the problem we wish to solve, as this would make many lives better.

Previously asked in: 2023 104 Q4 (v)

♦ Revisiting AI Project Cycle &amp; Ethical Frameworks for AI

1.1 AI Project Cycle

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### Model Answer

Under **Justice**, one looks at various parameters which affect the problem we wish to solve, as this would make many lives better.

Source: Types of Ethical Frameworks / Bioethics, Chapter 1

### Explanation

The principle of **Justice** in the Bioethics framework requires that benefits and burdens be distributed fairly across all people, irrespective of background. It demands awareness of social structures and determinants that affect different groups — essentially looking at all parameters affecting the problem to benefit the maximum number of people. Examiners expect the exact term "Justice" here.

Q19. § 1.2: Introduction to AI Domains

[1]

During Data Acquisition, feeding previous data into the machine is called:

- (a) Training Data
- (b) Predicting Data
- (c) Testing Data
- (d) Evaluating Data

Previously asked in: 2023 104 Q2 (iv)

♦ Revisiting AI Project Cycle &amp; Ethical Frameworks for AI

1.1 AI Project Cycle

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### Model Answer

#### (a) Training Data

Feeding previous (historical) data into the machine during Data Acquisition is called **Training Data**.

### Explanation

The AI Project Cycle passage states that the machine is "fed with datasets" for training. Training data refers to the pre-existing/historical data used to train the AI model. Students often confuse it with testing data — remember: **training = feeding past data in; testing = checking model on new data**.

Q20. § Unit Overview § 1.2: Introduction to AI Domains § Case Study

[1]

Whenever we want an AI project to be able to predict an output, we need to \_\_\_\_\_.

- (A) first test it using the data.
- (B) first train it using the data.
- (C) Both (A) and (B)
- (D) Neither (A) nor (B)

Previously asked in: 2024 104 Q2 (iv)

♦ Revisiting AI Project Cycle &amp; Ethical Frameworks for AI

1.1 AI Project Cycle

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**Model Answer****(B) first train it using the data.**

Before an AI model can predict any output, it must be trained on data so it can learn patterns and relationships from examples.

**Explanation**

The passage clearly states that under the learning-based approach, the AI model "gets trained on the data fed to it and then is able to design a model." Training always precedes testing/prediction. Testing (option A) comes *after* training to check accuracy — so "both A and B" is incorrect because training must happen *first*. The correct sequence is: train → then predict/test.

Q21. § 1.2: Introduction to AI Domains § Test Yourself

[2]

Differentiate between Data Acquisition and Data Exploration.

Previously asked in: 2025 104/S Q13

♦ Revisiting AI Project Cycle &amp; Ethical Frameworks for AI

Data Acquisition vs Data Exploration

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**Model Answer**

| Basis | Data Acquisition | Data Exploration |

|-----|-----|-----|

| **Meaning** | It is the process of collecting and gathering raw data from various sources for the AI project. | It is the process of analysing and understanding the collected data to find patterns and insights. || **Stage** | Done first — before any analysis. | Done after data is collected. |In short, Data Acquisition is about **collecting** data, while Data Exploration is about **understanding** it.*Source: AI Project Cycle, Data stages*

---

**Explanation**

- CBSE expects a clear point of difference — ideally in tabular form for "differentiate" questions, which saves words and scores neatly.
- **Data Acquisition** = gathering/collecting data (from surveys, sensors, web scraping, etc.).
- **Data Exploration** = examining/analysing the data (checking distributions, spotting trends, handling missing values).
- Even if the passage does not explicitly define both terms, these are standard AI Project Cycle concepts from the chapter. Always link your answer to the project cycle context.
- Two clear, contrasting points are sufficient for 2 marks.

Q22. § 1.2: Introduction to AI Domains § Test Yourself § Reflection Time

[2]

What role does data play in AI based applications ? Name any two sources of online data collection for building any AI based application.

Previously asked in: 2024 104 Q15

♦ Revisiting AI Project Cycle &amp; Ethical Frameworks for AI

1.1 AI Project Cycle

Sources of Online Data Collection for AI Applications

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### Model Answer

**Role of Data in AI:** Data acts as the training input for AI models. AI becomes intelligent based on the data it is trained on; the quality and type of data determine the accuracy and performance of the AI application.

### Two sources of online data collection:

1. Price comparison websites (e.g., PriceGrabber, Shopzilla)
2. Social media platforms / Email services (e.g., spam filter data)

Source: Chapter 1, Section 1.2 – Introduction to AI Domains

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### Explanation

- The first part (role of data) must mention that AI is trained on datasets and its intelligence depends on the data fed into it.
- For the two sources, the passage directly mentions **price comparison websites** and **email filters** as online data-driven applications — these are safe, textbook-based choices.
- Avoid writing lengthy definitions; 2-mark answers need concise, to-the-point responses.
- The key phrase examiners look for: "*AI becomes intelligent according to the training it gets*" — paraphrase this to show understanding.

Q23. § Unit Overview § Test Yourself § Reflection Time

[4]

What is the significance of AI project cycle? Also explain in detail about how Data Acquisition is different from data exploration.

Previously asked in: 2023 104 Q18

♦ Revisiting AI Project Cycle &amp; Ethical Frameworks for AI

1.1 AI Project Cycle

Data Acquisition vs Data Exploration

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### Model Answer

#### Significance of AI Project Cycle:

The AI Project Cycle provides a structured framework to develop AI projects efficiently. It guides developers through six stages — Problem Scoping, Data Acquisition, Data Exploration, Modelling, Evaluation, and Deployment — ensuring clarity at each step. It helps set clear goals, organise data, build accurate models, and deliver real-world solutions systematically.

#### Data Acquisition vs. Data Exploration:

| Aspect  | Data Acquisition                                            | Data Exploration                                                         |
|---------|-------------------------------------------------------------|--------------------------------------------------------------------------|
| Meaning | Collecting data from various reliable and authentic sources | Analysing collected data to identify patterns and trends                 |
| Purpose | To build the data foundation for the project                | To interpret and understand the data visually                            |
| Method  | Gathering raw data                                          | Representing data via graphs, charts, databases, flow charts, maps, etc. |

Thus, Data Acquisition focuses on **collecting** data, whereas Data Exploration focuses on **understanding** the collected data through visual representations and pattern recognition.

Source: AI Project Cycle, Section 1.1

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### Explanation

- Examiners expect the significance of the AI Project Cycle to be briefly stated (1–2 marks), followed by a clear distinction between Data Acquisition and Data Exploration (2 marks).
- Using a comparison table is effective for "difference" questions and saves words while earning full marks.
- Key terms to include: "reliable sources" for acquisition; "graphs, databases, flow charts" for exploration — these are directly from the textbook.
- Avoid writing lengthy paragraphs; crisp points/table are preferred.

## Q24. § Unit Overview

[2]

What is the purpose of Evaluation stage of AI project cycle? Discuss briefly.

Previously asked in: 2022 104 Q14

♦ Revisiting AI Project Cycle &amp; Ethical Frameworks for AI

1.1 AI Project Cycle

3.1 Importance of Model Evaluation

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**Model Answer**

The **Evaluation stage** assesses how well the trained AI model performs on new/test data. Its purpose is to measure the model's accuracy and efficiency, identify errors or weaknesses, and improve the model before deployment. It ensures the AI solution produces reliable and acceptable results in real-world conditions.

Source: AI Project Cycle, Chapter 1, Section 1.1

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**Explanation**

- The question is 2 marks, so ~40–50 words is ideal.
- Key points examiners look for: (1) testing on new data, (2) measuring accuracy/performance, (3) improving the model.
- Avoid writing about other stages; stay focused on **Evaluation** only.
- The word "briefly" confirms a concise answer is expected — no need for bullet elaboration.

## Q25. § 1.2: Introduction to AI Domains

[1]

Raghav can turn on and off any appliance remotely using an internet enabled device. This is an example of \_\_\_\_\_.

- (A) Artificial Intelligence (AI)
- (B) Internet of Things (IoT)
- (C) Computer Vision (CV)
- (D) Deep Learning (DL)

Previously asked in: 2024 104 Q4 (vi)

♦ Revisiting AI Project Cycle &amp; Ethical Frameworks for AI

Internet of Things (IoT) – Remote Control of Appliances via Internet-Enabled Devices

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**Model Answer****(B) Internet of Things (IoT)**

Controlling appliances remotely using an internet-enabled device is an example of the Internet of Things (IoT).

**Explanation**

IoT refers to connecting physical devices/appliances to the internet so they can be controlled or monitored remotely. The key clue in the question is "remotely using an internet enabled device" — this points directly to IoT, not AI, CV, or DL. Note: The source passages provided do not cover this topic, but the correct answer is standard CBSE curriculum knowledge.

Q26.

[2]

Differentiate between Kinesthetic Intelligence and Spatial Visual Intelligence.

Previously asked in: 2025 104/S Q11

♦ Revisiting AI Project Cycle &amp; Ethical Frameworks for AI

Kinesthetic Intelligence vs Spatial Visual Intelligence

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**Model Answer**

| Kinesthetic Intelligence | Spatial Visual Intelligence |

|---|---|

| It is the ability to use one's body skillfully to solve problems or create products (e.g., dancing, sports, surgery). |  
It is the ability to think in three dimensions and visualize spaces, objects, and images (e.g., painting, architecture, navigation). |

Kinesthetic intelligence involves bodily movement and physical coordination, while spatial visual intelligence involves perceiving and mentally manipulating visual-spatial information.

**Explanation**

**Note:** This question is **not covered in the provided source passages**, which focus on the AI Project Cycle, AI Domains, and Ethical Frameworks. Kinesthetic and Spatial Visual Intelligence are concepts from **Howard Gardner's Theory of Multiple Intelligences**, typically covered in a different chapter (usually related to "AI and Its Impact" or "Human Intelligence vs. AI").

**What examiners look for:**

- A clear point of difference (not just definitions)
- One example for each type helps score full marks
- A table format is ideal for "differentiate" questions in a 2-mark answer
- Keep it concise — one distinguishing row is sufficient for 2 marks

Q27. § Unit Overview § Test Yourself § Reflection Time

[4]

Consider the following scenarios and identify which AI domain would be most appropriate for each, with justification:

(A) An AI based education platform needs to translate to English language and analyze thousands of student essays to provide instant feedback on grammar, content quality and writing style. [2]

(B) An AI based application installed on a busy crossing in a metropolitan city scans all vehicles driving through that crossing during peak traffic hours and categorizes them into four wheelers and two wheelers. [2]

Previously asked in: 2026 104 Q18

♦ Revisiting AI Project Cycle &amp; Ethical Frameworks for AI

1.2 Introduction to AI Domains

6.2 Applications of NLP

Computer Vision Applications – Object Detection and Classification

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### Model Answer

#### (A) Natural Language Processing (NLP)

The most appropriate AI domain is **NLP**. The platform needs to translate essays into English and then analyze grammar, content quality, and writing style — all of which involve understanding and processing human natural language. NLP algorithms extract meaning from written text, making it ideal for grammar checking, feedback generation, and language translation tasks.

#### (B) Computer Vision (CV)

The most appropriate AI domain is **Computer Vision**. The application scans vehicles (visual data from a busy crossing) and categorizes them into four-wheelers and two-wheelers. CV enables machines to acquire, analyse, and interpret visual information from images or video feeds, making it perfect for vehicle detection and classification tasks.

Source: Chapter 1, Section 1.2 — Introduction to AI Domains

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### Explanation

- **Key rule:** Match the *type of data* to the domain — text/language → NLP; images/video → Computer Vision.
- For (A), two tasks are mentioned (translation + analysis of written text) — both fall under NLP. Mention both to get full marks.
- For (B), "scans vehicles" = visual input; "categorizes" = CV's core function. Reference surveillance/detection as a CV example.
- Examiners look for: correct domain name + valid justification linked to the scenario. One without the other loses a mark.

**Q28.** § 1.2: Introduction to AI Domains**[1]**

Which AI domain would be most suitable for developing a price comparison website ?

- (A) Computer Vision
- (B) Natural Language Processing
- (C) Statistical Data
- (D) Robotics

Previously asked in: 2026 104 Q5 (i)

♦ Revisiting AI Project Cycle & Ethical Frameworks for AI

1.2 Introduction to AI Domains

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### Model Answer

**(C) Statistical Data**

### Explanation

The passage explicitly lists price comparison websites (PriceGrabber, Shopzilla, etc.) as examples under the **Statistical Data** domain, which collects large datasets and derives meaning to aid decision-making.

Q29. § 1.2: Introduction to AI Domains § Test Yourself § Reflection Time

[4]

Categorise the following examples under the given three AI domains — Data Science, NLP and Computer Vision with justification :

- (a) Recommendation Websites
- (b) Voice-based Virtual Assistants
- (c) Spam Filters
- (d) Airline Route Planning

Previously asked in: 2025 104/S Q20

♦ Revisiting AI Project Cycle &amp; Ethical Frameworks for AI

1.2 Introduction to AI Domains

6.2 Applications of NLP

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### Model Answer

| Example | Domain | Justification |

| ---|---|---|

| (a) Recommendation Websites | Data Science (Statistical Data) | They collect and analyse large amounts of user data to suggest products/content, deriving meaningful insights from datasets. |

| (b) Voice-based Virtual Assistants | NLP | They interact with humans using natural spoken language; NLP algorithms decode and respond to human speech. |

| (c) Spam Filters | NLP | They detect certain words/phrases in emails to identify spam — one of the earliest NLP applications. |

| (d) Airline Route Planning | Data Science (Statistical Data) | They analyse large statistical datasets (weather, fuel, traffic) to extract insights and optimise flight routes. |

Source: Chapter 1, Section 1.2 — Introduction to AI Domains

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### Explanation

- **Key rule:** AI domains are categorised by the *type of data* fed into the model — Statistical Data, NLP, or Computer Vision.
- Recommendation/route-planning → statistical/numerical data → **Data Science**.
- Voice assistants and spam filters both deal with **natural language** (spoken or written) → **NLP**.
- Examiners award 1 mark per correct categorisation with valid justification. Simply naming the domain without justification risks losing the mark.
- Note: The passage explicitly lists *email/spam filters* as an NLP example — quote it directly for full marks.

Q30. § Unit Overview § Test Yourself § Reflection Time

[1]

\_\_\_\_\_ is the best example of Robotics and AI (Artificial Intelligence) working together.

- (A) Telephones
- (B) Self-driving cars
- (C) Bulb
- (D) Printing Machine

Previously asked in: 2025 104/S Q3 (iii)

♦ Revisiting AI Project Cycle &amp; Ethical Frameworks for AI

1.2 Introduction to AI Domains

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### Model Answer

#### (B) Self-driving cars

Self-driving cars are the best example of Robotics and AI working together, as they use AI for decision-making and robotic systems for physical navigation and control.

### Explanation

The answer is **(B) Self-driving cars** because they integrate AI (for perception, data processing, and decision-making) with robotic hardware (sensors, actuators, steering/braking systems). Telephones, bulbs, and printing machines do not combine both robotics and AI. In MCQs, write the option letter and a brief justification for full marks.

Q31. § 1.2: Introduction to AI Domains § Case Study § Reflection Time

[1]

Which AI application involves analysing large sets of data to extract meaningful insights for decision-making?

- (A) Computer Vision
- (B) Robotics
- (C) Natural Language Processing (NLP)
- (D) Data Science

Previously asked in: 2025 104/S Q2 (ii)

♦ Revisiting AI Project Cycle &amp; Ethical Frameworks for AI

1.2 Introduction to AI Domains

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### Model Answer

#### (D) Data Science

Data Science involves analysing large sets of data to extract meaningful insights, which are then used for informed decision-making.

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### Explanation

The passage describes **Statistical Data** (the AI domain closest to Data Science) as a system that "collects numerous data, maintains datasets and derives meaning/sense out of them... used to make a decision." This maps directly to Data Science. Computer Vision deals with visual data, Robotics with physical machines, and NLP with human language — none focus on large-scale data analysis for decision-making.

**Q32.** § Unit Overview § Reflection Time**[1]**

Identify the logo of an application of AI given below. It helps us to navigate to places.

Previously asked in: 2024 104 Q3 (i)

♦ Revisiting AI Project Cycle &amp; Ethical Frameworks for AI

1.2 Introduction to AI Domains

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The logo shown is of **Google Maps**, an AI-based navigation application that uses machine learning and real-time data to help users navigate and find routes to places.

**Explanation**

The question tests knowledge of real-world AI applications. Google Maps is a well-known example of AI in navigation (falls under Statistical Data/Computer Vision domains). In a 1-mark MCQ, simply naming the application correctly with a brief description is sufficient. If the logo shown is of a different app (e.g., Waze, Apple Maps), name that one instead.

**Q33.****[1]**

Platforms such as Spotify, Facebook, Instagram, Amazon, Netflix etc. shows recommendation on the basis of what you like. Which is the technology behind this ?

- (A) Human Intelligence
- (B) Platform Intelligence
- (C) Artificial Intelligence
- (D) Application Intelligence

Previously asked in: 2024 104 Q2 (ii)

♦ Revisiting AI Project Cycle &amp; Ethical Frameworks for AI

1.2 Introduction to AI Domains

**Generated by claude-sonnet-4-6 • 2026-06-21 03:18 • grounding rag****Model Answer****(C) Artificial Intelligence****Explanation**

Recommendation systems on platforms like Spotify, Netflix, and Amazon use AI algorithms trained on user data to suggest content. This is a direct application of AI (Statistical Data domain). Examiners expect you to simply identify the correct option with no elaboration needed for a 1-mark MCQ.

## Q34. § Unit Overview § Reflection Time

[4]

Give any four examples of applications of AI that we see around us.

Previously asked in: 2024 104 Q18

♦ Revisiting AI Project Cycle &amp; Ethical Frameworks for AI

1.2 Introduction to AI Domains

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**Model Answer**

Four examples of AI applications we see around us:

1. **Computer Vision** – Used in agricultural monitoring to detect crop diseases, and in facial recognition systems for security.
1. **Natural Language Processing (NLP)** – Used in virtual assistants (like Siri/Alexa) and chatbots that interact with humans using natural language.
1. **Healthcare AI** – AI algorithms are used to identify high-risk patients and help hospitals allocate medical resources effectively.
1. **Recommendation Systems** – AI analyses user behaviour to recommend products (e-commerce) or content (streaming platforms), influencing everyday decisions.

These applications span domains such as statistical data analysis, computer vision, and NLP.

Source: Unit 1 – Revisiting AI Project Cycle & Ethical Frameworks for AI, Chapter 1

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**Explanation**

- The question asks for **four examples**, so give exactly four, each worth ~1 mark.
- The source material lists AI domains: **Statistical Data, Computer Vision, and NLP** — link your examples to these domains for accuracy.
- The case study explicitly mentions a **healthcare AI algorithm**, making it a strong, textbook-backed example.
- Do **not** simply name the domain; briefly describe the application to show understanding (that's what earns the mark).
- Avoid padding — one sentence per example is enough at this mark level.

**Q35.** § Unit Overview § Reflection Time

[4]

Will it be valid to say that not all the devices which are termed as "smart" are AI-enabled? Justify this statement. Explain any two examples from the daily life which are commonly misunderstood as AI.

Previously asked in: 2023 104 Q20

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1.2 Introduction to AI Domains

2.1 Revisiting AI, ML, DL

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**Model Answer**

**Yes, it is valid to say that not all "smart" devices are AI-enabled.**

"Smart" simply means a device can connect to the internet or perform automated tasks. AI, however, requires the ability to learn from data, make decisions, and improve over time. A device can be smart without having any AI capability.

**Two commonly misunderstood examples:**

1. **Smart TV** – A Smart TV connects to the internet and runs apps like Netflix or YouTube. It does not learn or make decisions on its own; it simply executes programmed functions. Hence, it is smart but not AI-enabled.
1. **Smart Street Lights** – These lights turn on/off automatically based on a timer or light sensor. This is pre-programmed automation, not AI, as no learning or data-based decision-making is involved.

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**Explanation**

- The question tests whether you understand the **difference between "smart" (connected/automated) and "AI-enabled" (learns from data, makes decisions)**.
- CBSE examiners expect: one clear justification statement + two distinct, well-explained examples. Avoid listing examples without explaining *why* they are not AI.
- Do not confuse automation/connectivity with machine learning or intelligence — that distinction is the core of the answer.
- Keep each example to 2 lines: name it, describe what it does, state why it is NOT AI.

**Q36.** § 1.2: Introduction to AI Domains**[1]**

Identify the incorrect statements from the following:

- (i) AI models can be broadly categorized into four domains.
  - (ii) Data sciences is one of the domain of AI model.
  - (iii) Price comparison websites are examples of data science.
  - (iv) The information extracted through data science can be used to make decision about it.
- (a) Only (iv)
  - (b) (iii) and (iv)
  - (c) Only (i)
  - (d) (ii) and (iii)

Previously asked in: 2023 104 Q2 (iii)

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**Model Answer****(d) (ii) and (iii)**

Statement (i) is incorrect — AI models are categorized into **three** domains, not four. Statement (ii) is incorrect — the three domains are Statistical Data, Computer Vision, and NLP; "Data Sciences" is not a domain.

Wait — re-reading the options: the answer is **(d) (ii) and (iii)** — statement (ii) names the domain incorrectly as "data science" (it is **Statistical Data**), and statement (iii) incorrectly labels price comparison websites as examples of data science instead of **Statistical Data**.

**Answer: (d) (ii) and (iii)**

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**Explanation**

The passage clearly states AI models are categorized into **three** domains (not four): Statistical Data, Computer Vision, and NLP. "Data science" is not the correct name — the domain is called **Statistical Data**. Price comparison websites are examples of **Statistical Data**, not "data science." Statement (iv) is actually correct — the passage says information from statistical data can be used to make decisions. So statements (ii) and (iii) are both incorrect → option **(d)**.

**Q37.** § Unit Overview § 1.2: Introduction to AI Domains

[1]

Which of the following represent a machine that is smart but not considered Artificial Intelligence (AI) enabled ?

- (a) A robotic vacuum cleaner that can navigate and clean floors autonomously.
- (b) A chatbot that engages in natural language conversations and answers questions.
- (c) A smartphone with facial recognition for unlocking the device.
- (d) A digital alarm clock that rings at a set time every morning.

Previously asked in: 2024 104 Q2 (iii)

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1.2 Introduction to AI Domains

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**Model Answer**

**(d) A digital alarm clock that rings at a set time every morning.**

**Explanation**

A digital alarm clock follows a fixed, pre-programmed instruction (ring at a set time) — it does not learn, adapt, or make decisions. The other options (robotic vacuum, chatbot, facial recognition) all involve AI techniques such as navigation algorithms, natural language processing, or machine learning. AI refers to machines mimicking human intelligence through algorithms and data; a simple alarm clock merely executes a hardcoded rule with no intelligence involved.

**Q38.** § 1.2: Introduction to AI Domains

[1]

Which of the following represents an example of a recommendation system ?

- (a) An online clothing store that offers a wide variety of clothing options.
- (b) A search engine that retrieves relevant web pages based on user queries.
- (c) An e-commerce website that displays customer reviews and ratings for products.
- (d) A music streaming platform that suggests songs and playlists based on user listening history.

Previously asked in: 2024 104 Q4 (iv)

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1.2 Introduction to AI Domains

Collaborative Filtering / Recommendation Systems

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**Model Answer**

**(d) A music streaming platform that suggests songs and playlists based on user listening history.**

**Explanation**

A recommendation system suggests items to users based on their past behaviour or preferences. Option (d) directly matches this — the platform analyses listening history to suggest relevant songs. Options (a), (b), and (c) describe a product catalogue, a search engine, and a review display system respectively, none of which involve personalised recommendations. The textbook also cites Spotify/Netflix-style platforms as classic examples of recommendation systems using clustering/unsupervised learning.

Q39. § Unit Overview § 1.2: Introduction to AI Domains

[1]

\_\_\_\_\_ enables computers to mimic human intelligence.

- (A) Cloud Computing
- (B) Artificial Intelligence
- (C) Web Development
- (D) Data Entry

Previously asked in: 2025 104/S Q2 (i)

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1.2 Introduction to AI Domains

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### Model Answer

#### (B) Artificial Intelligence

#### Explanation

The passage directly states: "Artificial Intelligence, or AI for short, refers to any technique that enables computers to mimic human intelligence." This is the definition examiners expect you to recall. Source: Chapter 2, Section 2.1 – Revisiting AI, ML, DL.

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