

CBSE CLASS X
Artificial Intelligence (417)**ANSWER KEY***From previous CBSE Board Exam questions***Code: X3Y6ZJ****Questions: 22****Maximum Marks: 31****Generated: 2026-06-21 02:53****SELECTIONS USED**

Source	Previous-year board
Subject	Artificial Intelligence
Lessons	Computer Vision
Year	2022-2026
Questions selected	22

Composition — Types: 12 MCQ · 7 Short · 2 Assertion–reason · 1 Long

Q1. § 5.1 Applications of Computer Vision**[1]**

The Face Filter feature in Instagram is an application of _____.

- (A) NLP
- (B) Computer Vision
- (C) Data Science
- (D) Blockchain Technology

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

♦ **Computer Vision** 5.2 Computer Vision Tasks**Generated by claude-sonnet-4-6 · 2026-06-21 03:18 · grounding rag****Model Answer****(B) Computer Vision****Explanation**

The passage under 5.1 *Applications of Computer Vision* explicitly states: "Modern-day apps like Instagram and Snapchat have a lot of features based on the usage of computer vision. The application of face filters is one among them." So (B) is the only correct option.

Q2. § Test Yourself

[1]

Assertion (A) : The less pixels you have, the better is the image quality.

Reason (R) : Resolution refers to the number of pixels per unit of area in an image, determining its clarity and detail.

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

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

♦ Computer Vision

5.4 Image Features

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Model Answer

(D) Assertion (A) is false, but Reason (R) is true.

The Assertion is false — *more* pixels means better image quality, as the image more closely resembles the original. The Reason is true — resolution refers to the number of pixels, determining clarity and detail.

Explanation

The textbook clearly states: "*The more pixels you have, the more closely the image resembles the original.*" So the Assertion is factually incorrect. The Reason correctly defines resolution. Since A is false and R is true, option (D) is correct. Always check Assertion and Reason independently before picking an option.

Q3. § 5.2 Computer Vision Tasks § Test Yourself

[1]

What does the term "image processing" refer to in Computer Vision ?

- (A) Editing videos
- (B) Extracting meaningful information from images
- (C) Playing audio files
- (D) Compiling codes

Previously asked in: 2024 104 Q2 (v)

♦ Computer Vision

5.2 Computer Vision Tasks

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Model Answer

(B) Extracting meaningful information from images

Image processing focuses on processing raw input images to enhance them or prepare them for further tasks, while extracting meaningful information is the broader goal of Computer Vision.

Explanation

The question asks specifically about "image processing" in the context of Computer Vision. According to the source, image processing is a **subset** of Computer Vision focused on processing/enhancing raw images — but the correct option (B) reflects the overall purpose of Computer Vision tasks that image processing supports. Examiners expect students to pick (B) as it best matches the described role. Note the distinction: image processing prepares images; Computer Vision extracts meaning.

Source: Chapter 5, Section 5.1 (Computer Vision Vs. Image Processing table)

Q4. § 5.2 Computer Vision Tasks**[1]**

In Computer Vision, which of the following tasks is used for single object ?

- (A) Object Detection
- (B) Classification + Localization
- (C) Instance Segmentation
- (D) Non-Localization

Previously asked in: 2024 104 Q3 (iii)

♦ Computer Vision

5.2 Computer Vision Tasks

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Model Answer**(B) Classification + Localization**

Classification + Localization involves identifying what object is present and its location, and is used only for single objects.

Source: Chapter 5, Section 5.2 Computer Vision Tasks

Explanation

The passage explicitly states: "*It is used only for single objects*" for Classification + Localization. Object Detection handles multiple objects, and Instance Segmentation deals with pixel-level labeling of multiple instances. "Non-Localization" is not a real CV task. Examiners expect the correct option with a brief justification from the text.

Q5. § 5.2 Computer Vision Tasks

[2]

Name the tasks used in Computer Vision applications for :

- (a) Single objects
- (b) Multiple objects

Previously asked in: 2025 104/S Q16

♦ Computer Vision 5.2 Computer Vision Tasks

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Model Answer**(a) Single objects:**

The tasks used for single objects are **Classification** (assigning one label to the image) and **Classification + Localisation** (identifying what object is present and where it is located in the image).

(b) Multiple objects:

The tasks used for multiple objects are **Object Detection** (finding instances of real-world objects in images/videos) and **Instance Segmentation** (detecting object instances, assigning categories, and labelling each pixel).

Source: Chapter 5, Section 5.2 Computer Vision Tasks

Explanation

- The examiner expects you to correctly pair the task with single/multiple objects.
- **Classification + Localisation** is explicitly stated in the passage as being "used only for single objects."
- **Object Detection** and **Instance Segmentation** deal with multiple object instances.
- Name the task clearly and give a brief one-line description — that earns full marks for a 2-mark question.

Q6. § Unit Introduction and Objectives § 5.1 Applications of Computer Vision § 5.2 Computer Vision Tasks

[1]

Statement 1 : Various search engines and e-commerce portals now have a new feature called image-based search using computer vision.

Statement 2 : Image-based search helps in finding items, people and places by giving their sounds to the system.

- (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 Q5 (iii)

♦ Computer Vision 5.2 Computer Vision Tasks

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Model Answer

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

Statement 1 is correct. Statement 2 is incorrect because image-based search finds items, people, and places by giving their **images** (not sounds) to the system.

Explanation

The key error in Statement 2 is the word "sounds" — image-based search uses **visual/image input**, not audio. Statement 1 is well-supported by the passage (Google's Search by Image uses Computer Vision). Examiners expect you to identify the exact factual error.

Q7. § 5.2 Computer Vision Tasks § 5.3 No-Code AI Tools

[1]

Anita and Surjit are creating an AI application that will classify different types of fruits. The Computer Vision task that will identify the type of fruit and assign a label to it is called _____.

- (A) Segmentation
- (B) Classification
- (C) Classification + Localization
- (D) Object Detection

Previously asked in: 2026 104 Q2 (i)

♦ Computer Vision

5.2 Computer Vision Tasks

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Model Answer

(B) Classification

Classification is the task of assigning an input image one label from a fixed set of categories, which is exactly what identifying and labelling a type of fruit involves.

Explanation

- **Classification** assigns a single label to the whole image (e.g., "Mango", "Apple").
- **Classification + Localization** also finds *where* the object is — not needed here.
- **Object Detection** handles *multiple* objects with locations.
- **Segmentation** labels individual pixels.
- Since the task only asks to identify the fruit type and assign a label, Classification is correct.

Q8. § 5.2 Computer Vision Tasks

[1]

In computer vision which of the following tasks is used for multiple objects ?

- (a) Classification
- (b) Classification + Localisation
- (c) Instance Segmentation
- (d) Localisation

Previously asked in: 2024 104 Q3 (iv)

♦ Computer Vision

5.2 Computer Vision Tasks

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Model Answer

(c) Instance Segmentation

Instance Segmentation detects multiple objects, assigns each a category, and labels every pixel — making it suitable for handling multiple objects simultaneously.

Source: Computer Vision Tasks, Chapter 5

Explanation

The passage states Classification + Localisation is used **only for single objects**, while Instance Segmentation handles **detecting instances** (multiple objects) and labels each pixel. Object Detection also handles multiple objects, but it is not among the options; Instance Segmentation is the best answer from the given choices.

Q9. § 5.2 Computer Vision Tasks

[2]

Differentiate between Computer Vision (CV) and Natural Language Processing (NLP).

Previously asked in: 2024 104 Q11

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5.2 Computer Vision Tasks

6.2 Applications of NLP

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Model Answer

| Basis | Computer Vision (CV) | Natural Language Processing (NLP) |

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

| **Definition** | Enables machines to interpret and understand visual information (images/videos). | Enables machines to understand and process human language (text/speech). |

| **Input** | Images, videos | Text, audio/speech |

| **Example** | Facial recognition, object detection | Chatbots, language translation |

Source: Unit 5: Computer Vision, Chapter 5

Explanation

- Examiners expect a **tabular format** for "differentiate" questions — it's cleaner and earns full marks faster.
- You need at least **2 clear points of difference** for 2 marks.
- CV focuses on **visual data**; NLP focuses on **language data** — this is the core distinction to highlight.
- Even though NLP is not covered in the source passages, CBSE expects you to know this distinction from general AI knowledge introduced earlier in the course.

Q10. § Unit Introduction and Objectives § 5.1 Applications of Computer Vision § Test Yourself

[2]

Give any two key impacts of Computer Vision on medical imaging.

Previously asked in: 2024 104 Q14

♦ Computer Vision

5.2 Computer Vision Tasks

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Model Answer

Two key impacts of Computer Vision on medical imaging are:

1. **Conversion of 2D scans to 3D models:** It reads and converts 2D scan images into interactive 3D models, enabling medical professionals to gain a detailed understanding of a patient's health condition.
1. **Assisting doctors in interpretation:** It acts as an assistant to physicians by not only creating and analysing medical images but also helping doctors interpret them accurately.

Source: Applications of Computer Vision, Chapter 5

Explanation

- The question is 2 marks, so two distinct points are needed — one per mark.
- Both points must come directly from the "Medical Imaging" paragraph in Section 5.1.
- Examiners look for: (a) 3D model conversion from 2D scans, and (b) the role as a diagnostic assistant/interpreter for doctors.
- Avoid vague answers like "it helps in hospitals" — be specific to what the textbook states.

Q11. § 5.5 Convolution

[1]

What is the range of possible pixel values in a byte image format ?

- (A) 0 to 100
- (B) 0 to 255
- (C) 1 to 256
- (D) -128 to 127

Previously asked in: 2026 104 Q3 (ii)

♦ Computer Vision

5.4 Image Features

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Model Answer**(B) 0 to 255**

In the byte image format, pixel values range from **0 to 255**, where each pixel is stored as a single byte (8 bits).

Source: Chapter 5, Section 5.5 Convolution

Explanation

The passage explicitly states: *"pixels have values varying from 0 to 255 and the value of the pixel determines the color of that pixel."* A byte (8 bits) can store $2^8 = 256$ values, i.e., 0 to 255. Option (B) is directly confirmed by the source. Remember: 0 = darkest (black), 255 = brightest (white/full color).

Q12. § Test Yourself

[1]

Assertion (A) : The term used to refer to the number of pixels in an image is resolution.

Reason (R) : Resolution in an image denotes the total number of pixels it contains, usually represented as height × width.

- (a) Both (A) and (R) are true and (R) is the correct explanation for (A).
- (b) Both (A) and (R) are true and (R) is not the correct explanation for (A).
- (c) (A) is true, but (R) is false.
- (d) (A) is false, but (R) is true.

Previously asked in: 2024 104 Q5 (i)

♦ Computer Vision

5.4 Image Features

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

The term "resolution" refers to the number of pixels in an image, expressed as width × height (e.g., 1280×1024), so (R) correctly explains (A).

Source: Chapter 5, Section 5.2 – Resolution

Explanation

The textbook explicitly states: *"The number of pixels in an image is sometimes called the resolution... one convention is to express resolution as the width by the height, for example, 1280×1024."* Both the Assertion and Reason are accurate, and the Reason directly defines/explains the Assertion — so option (a) is correct. Note: the Reason says "height × width" while the book says "width × height" — both express the same idea and are acceptable.

Q13. § 5.1 Applications of Computer Vision**[1]**

The concept of _____ is used to apply face filters on various social media platforms.

- (a) NLP
- (b) Computer Vision
- (c) Data Science
- (d) Block chain Technology

Previously asked in: 2024 104 Q5 (iv)

♦ Computer Vision

5.2 Computer Vision Tasks

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Model Answer**(b) Computer Vision****Explanation**

The passage explicitly states that face filters on apps like Instagram and Snapchat use **Computer Vision** to identify facial dynamics and apply the selected filter. This is a direct fact from Section 5.1 Applications of Computer Vision.

Q14. § Test Yourself**[1]**

Which of the following best describes the relationship between pixels and image resolution ?

- (A) More pixels result in lower image quality.
- (B) Pixels and resolution are unrelated concepts.
- (C) Resolution depends only on image file size.
- (D) The number of pixels in an image is known as resolution.

Previously asked in: 2026 104 Q4 (iv)

♦ Computer Vision

5.4 Image Features

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Model Answer**(D) The number of pixels in an image is known as resolution.****Explanation**

Resolution refers to the total number of pixels in an image (e.g., expressed as 1280×1024). More pixels = higher resolution = better image quality. Options A and B are factually incorrect; Option C is wrong as resolution depends on pixel count, not file size.

Q15. § 5.2 Computer Vision Tasks § Test Yourself**[1]**

In the context of Computer Vision vs Image Processing, which statement correctly differentiates them ?

- (A) Computer Vision and Image Processing are exactly the same.
- (B) Computer Vision enhances the image while Image Processing does not.
- (C) Computer Vision is a superset of Image Processing.
- (D) Image Processing is a superset of Computer Vision.

Previously asked in: 2026 104 Q5 (iii)

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Model Answer

(C) Computer Vision is a superset of Image Processing.

Explanation

The textbook table explicitly states: "Computer Vision is a superset of Image Processing" and "Image Processing is a subset of Computer Vision." Image Processing enhances/prepares images; Computer Vision extracts meaningful information from them. Option (C) is the only correct differentiator.

Q16. § Reflection Time**[2]**

Differentiate between grayscale and RGB images.

Previously asked in: 2024 104 Q16

♦ Computer Vision 5.1 Introduction

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Model Answer

Feature	Grayscale Image	RGB Image
Channels	Single channel (1 plane)	Three channels — Red, Green, Blue
Pixel value	One value per pixel (0–255)	Three values per pixel (R, G, B)
Storage size	Height × Width	Height × Width × 3
Representation	Shades of gray (black to white)	Full colour image

A grayscale image stores each pixel using **1 byte** (single intensity value), while an RGB image stores each pixel using **3 values** combining red, green, and blue intensities to produce colour.

Source: Chapter 5, Sections — Grayscale Images & RGB Images

Explanation

- Examiners expect a **comparison format** (table or two clear points) for "differentiate" questions.
- Key contrast points: number of channels, values per pixel, and how colour is represented.
- Remember: grayscale pixel size = 1 byte; RGB pixel = 3 bytes (one per channel). This is a commonly tested fact.
- Avoid writing long paragraphs — a neat table with 3–4 rows earns full marks efficiently.

Q17. § 5.2 Computer Vision Tasks

[1]

Which computer vision task involves both identifying what object is present in an image and determining the precise location of that object within the image?

- (A) Image Classification
- (B) Object Detection
- (C) Instance Segmentation
- (D) Classification + Localisation

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

♦ Computer Vision

5.2 Computer Vision Tasks

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Model Answer**(D) Classification + Localisation**

This task involves both identifying what object is present in an image and determining its precise location within the image.

Source: Chapter 5, Section 5.2 Computer Vision Tasks

Explanation

The passage explicitly states: "*Classification + Localisation is the task that involves both processes of identifying what object is present in the image and at the same time identifying at what location that object is present.*"

Object Detection (B) also finds locations, but for multiple objects; Classification + Localisation is specifically defined as doing both identification and location for a single object — matching the question exactly.

Q18. § 5.5 Convolution § Reflection Time

[2]

How do computers store RGB images ?

Previously asked in: 2026 104 Q13

♦ Computer Vision

5.4 Image Features

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Model Answer

Computers store RGB images using three separate channels — Red (R), Green (G), and Blue (B). Each channel is a 2D array of pixels, with each pixel value ranging from **0 to 255**. All three channels are combined to form the final colour image. Thus, each pixel in an RGB image has **three values** that together determine its colour.

Source: Chapter 5, RGB Images section

Explanation

- The examiner expects you to mention: **three channels (R, G, B)**, pixel values **0–255**, and that combining all three gives the final colour.
- Avoid writing about grayscale here — stay focused on RGB storage.
- A diagram description (channels stacked) earns full marks if time allows, but the written explanation above is sufficient for 2 marks.

Q19.**[1]**

Which of the following is the correct expansion of CSV ?

- (A) Comma and Space Value
- (B) Comma Separated Values
- (C) Control Separated Values
- (D) Character Separated Values

Previously asked in: 2024 104 Q4 (i)

♦ **Computer Vision**

CSV (Comma-Separated Values) File Format

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Model Answer

(B) Comma Separated Values

CSV stands for **Comma Separated Values** — a file format where data values are separated by commas.

Explanation

This is a straightforward full-form question. "Comma Separated Values" is the standard, universally accepted expansion of CSV. The other options are distractors with incorrect words (Space, Control, Character). Always remember the exact full form.

Q20. § 5.3 No-Code AI Tools**[1]**

With reference to AI domain, expand the term CV.

Previously asked in: 2023 104 Q4 (iv)

♦ **Computer Vision**

Introduction to Computer Vision (CV) – Expansion of the term

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Model Answer

CV stands for **Computer Vision** — a branch of Artificial Intelligence that enables machines to interpret and understand visual information from the real world.

Explanation

The question asks for the full form of CV in the AI domain. From the textbook, Unit 5 is titled *Computer Vision* and the term CV is used in section 5.2 in reference to image classification tasks. Examiners expect the full form plus a one-line definition for context in a 1-mark answer.

Q21. § 5.6 Convolution Neural Networks (CNN)

[4]

Answer the following:

(A) Expand and define the terms CNN and ANN. [3]

(B) In the diagram of neural network given below, identify the layer that should be depicted in Box 1 and Box 2: [1]

Previously asked in: 2026 104 Q20

♦ Computer Vision

2.3 Artificial Neural Networks

5.6 Convolution Neural Networks (CNN)

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Model Answer**(A) CNN and ANN:**

CNN – Convolutional Neural Network: CNN is a Deep Learning algorithm that takes an input image, assigns importance (learnable weights and biases) to various aspects/objects in the image, and differentiates one from the other. It consists of layers: Convolution Layer, ReLU, Pooling Layer, and Fully Connected Layer.

ANN – Artificial Neural Network: ANN is a computational model inspired by the human brain, consisting of interconnected nodes (neurons) organised in layers that process information to learn patterns and make decisions.

(B) Identification of Layers:

- **Box 1 → Hidden Layer** (the intermediate processing layer between input and output)
- **Box 2 → Output Layer** (produces the final prediction/result)

Source: Chapter 5, Section 5.6 Convolutional Neural Networks (CNN)

Explanation

- For **(A)**, the examiner expects the full form + a clear definition for each term. CNN's definition is directly from the textbook (Section 5.6); ANN is a prerequisite concept — keep it concise but accurate.
- For **(B)**, in a standard feedforward neural network diagram, the layers in order are: **Input Layer → Hidden Layer(s) → Output Layer**. Since Box 1 and Box 2 are the unlabelled middle and last layers respectively, they correspond to Hidden Layer and Output Layer. Always name them precisely — partial credit may be lost for vague answers.
- Do **not** expand on CNN layers in sub-question (A) beyond what is necessary; save word count as this is only 3 marks.

Q22. § 5.1 Applications of Computer Vision**[2]**

Face lock feature of a smartphone is an example of computer vision. Briefly discuss this feature.

Previously asked in: 2023 104 Q15

♦ Computer Vision

5.2 Computer Vision Tasks

5.4 Image Features

5.6 Convolution Neural Networks (CNN)

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Model Answer

Face lock (facial recognition) is a computer vision application where the smartphone's camera captures the user's face and converts it into digital data. The algorithm analyses facial features (like eyes, nose, jawline) and compares them with the stored facial data. If it matches, the phone unlocks; otherwise, access is denied.

Source: Applications of Computer Vision, Chapter 5

Explanation

- The question asks you to **briefly discuss**, so 2–3 sentences covering *what it does* and *how it works* is sufficient.
- Key points examiners expect: camera captures face → features analysed → compared with stored data → match/no match decision.
- Avoid writing a long paragraph; 40–55 words is ideal for 2 marks.
- The textbook specifically mentions facial recognition under security applications — link your answer to that context.

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