PRACTICE PAPER-5
CLASS XII
ARTIFICIAL INTELLIGENCE

Time: 2 Hours   **Maximum Marks: 50**

General Instructions:

1. Please read the instructions carefully.
2. This Question Paper consists of **21 questions** in two sections: **Section A** & **Section B**.
3. Section A has Objective type questions whereas Section B contains Subjective type questions.
4. **Out of the given (5 + 16 =) 21 questions, a candidate has to answer (5 + 10 =) 15 questions in the allotted (maximum) time of 2 hours.**
5. All questions of a particular section must be attempted in the correct order.
6. **SECTION A—OBJECTIVE TYPE QUESTIONS (24 MARKS):**
   (a) This section has 5 questions.
   (b) Marks allotted are mentioned against each question/part.
   (c) There is no negative marking.
   (d) Do as per the instructions given.
7. **SECTION B—SUBJECTIVE TYPE QUESTIONS (26 MARKS):**
   (a) This section has 16 questions.
   (b) A candidate has to do 10 questions.
   (c) Do as per the instructions given.
   (d) Marks allotted are mentioned against each question/part.

SECTION A—OBJECTIVE TYPE QUESTIONS

1. **Answer any 4 out of the given 6 questions on Employability Skills.**   **4 x 1 = 4**

   (i) During a group discussion, Arjun explains his perspective on the project's timeline. He says, "I'm concerned we're spending too much time on the initial design phase. I think we should move directly to coding the basic features and then fix the design later, or we'll miss the deadline." Meena listens carefully and understands his point, but she needs to confirm it before offering her own opinion on the deadline.   [1]

   If Meena wanted to follow the **'P'** of **RESPECT**, what should she do?

   (a) Immediately argue that the design phase is the most important part of the project.

   (b) Ask a clarifying question like, "So, just to make sure I understand, you're saying we should skip the design phase entirely and start coding right away to save time?"

   (c) Change the subject by asking the group what they think the deadline is.

   (d) Say nothing and wait for Arjun to ask for her opinion directly.

   (ii) A disregard for the rights of others, combined with a pattern of deceitfulness, impulsivity and lack of remorse, is the defining characteristic of _____ personality disorder.   [1]

   (iii) Match the following skills with the correct descriptions: [1]

Skills	Description
1. Leadership	(a) To maintain a positive attitude and view setbacks as temporary obstacles.
2. Optimism	(b) To guide, motivate and influence others toward achieving a common goal.
3. Efficiency	(c) To complete tasks using minimum time, effort or resources while maintaining quality.

   (a) 1-c,   2-b,   3-a

   (b) 1-b,   2-a,   3-c

   (c) 1-a,   2-b,   3-c

   (d) 1-b,   2-c,   3-a

(iv) What is the keyboard shortcut to insert a new slide into a presentation? [1]

(a) Ctrl+N   (b) Ctrl+S

(c) Ctrl+M   (d) Ctrl+P

(v) **Assertion (A):** Innovative entrepreneurs continuously look for new ways to solve problems and improve existing products. [1]

Reason (R): Innovation in entrepreneurship happens only by copying ideas from competitors.

(a) Both A and R are correct and R is the correct explanation of A.

(b) Both A and R are correct but R is not the correct explanation of A.

(c) A is correct but R is incorrect.

(d) A is incorrect but R is correct.

(vi) Agroforestry is a practice that integrates trees and shrubs into agricultural landscapes to improve soil health and enhance biodiversity. *(State whether this is True or False)* [1]

2. **Answer any 5 out of the given 6 questions.**   **5 x 1 = 5**

(i) Match the correct questions from Column A to the correct step of the Data Science Methodology in Column B. [1]

Column A	Column B
1. How do we ensure creative and innovative solutions while meeting the needs of the end user?	(a) Design Thinking
2. It helps us to create a tangible representation of the selected solution.	(b) Recall
3. What is actually yes? How often does the model predict yes?	(c) Data Preparation
4. How do we ensure the raw data is ready for analysis and modelling?	(d) Prototype

(a) 1-d,   2-b,   3-a   4-c

(b) 1-b,   2-d,   3-c   4-a

(c) 1-a,   2-d,   3-b   4-c

(d) 1-d,   2-c,   3-a   4-b

(ii)
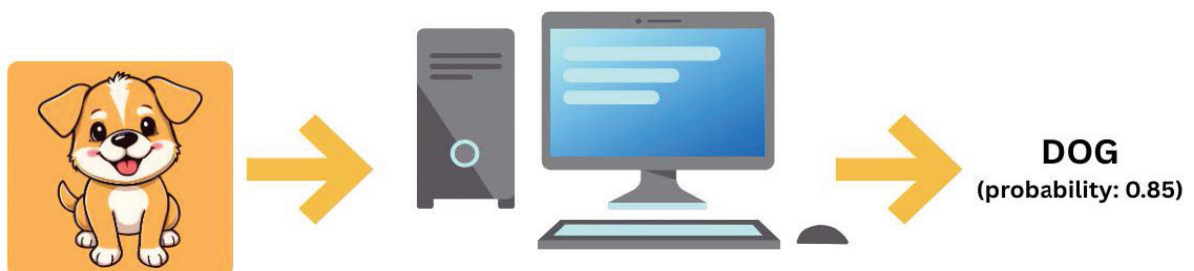
The given image shows a vision-based model in action. Identify which task is being performed. [1]

(iii) Which global trends have most directly addressed the infrastructural challenges of processing power and scalable resource access in Big Data Analytics? [1]

(a) Cloud Computing   (b) Edge Computing

(c) Quantum Computing   (d) Brook's Law

(iv) In a GAN, the network that is responsible for generating fake data from noise is called _____. [1]

(v)
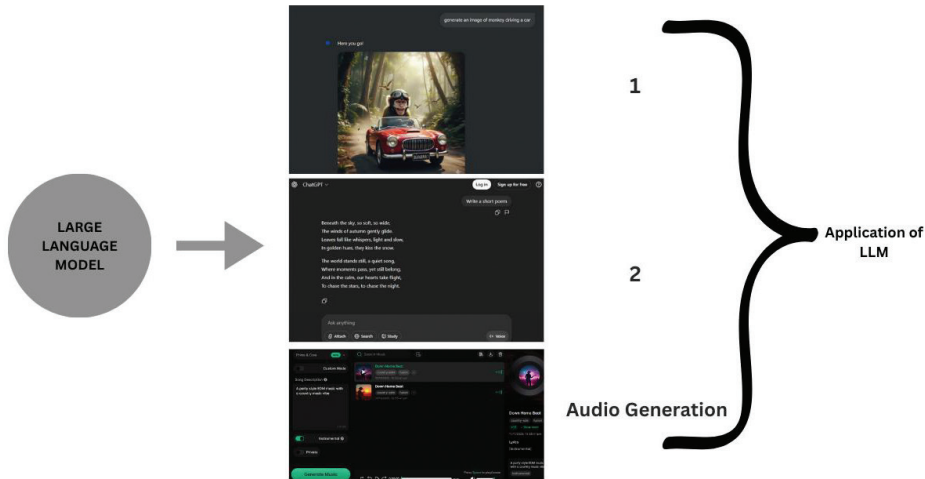
What will come in place of '1' and '2'? [1]

(vi) Which of the following are the three core components that form the 'trinity' of data storytelling? [1]
  (a) Data, Charts and Reports
  (b) Data, Visuals and Narrative
  (c) Statistics, Images and Text
  (d) Information, Design and Speech

3. Answer any 5 out of the given 6 questions.   5 x 1 = 5
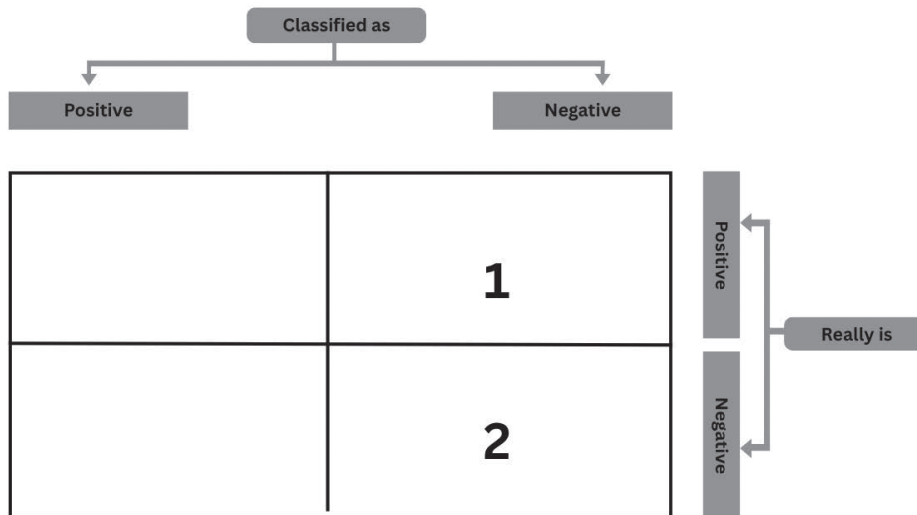
(i) When data is limited, a strategy called _____ is used to maximize the use of available samples by dividing the dataset into multiple folds. [1]

(ii) [1]

What will come in place of '1' and '2'?
  (a) False Positives, False Negatives
  (b) True Positives, False Negatives
  (c) False Positives, False Negatives
  (d) True Positives, True Negatives

(iii) Match the image processing technique in Column A with its correct description in Column B. [1]

Column A	Column B
1. Edge Detection	(a) Finds the point where two or more edges meet.
2. Shape Detection	(b) Focuses on identifying geometric structures within an image, such as lines or circles.
3. Noise Reduction	(c) Adjusting the dimension of the image without changing the internal content.
4. Resizing	(d) Refers to unwanted distortions or variations in pixel value that reduce image quality.

(a) 1-d, 2-b, 3-a 4-c

(b) 1-d, 2-c, 3-b 4-a

(c) 1-a, 2-b, 3-d 4-c

(d) 1-d, 2-c, 3-a 4-b

(iv) Big Data provides several advantages to organizations. Which of the following is **NOT** an advantage of Big Data? [1]

(a) Reduced ethical and regulatory challenges
(b) Better decision-making
(c) High return on investment
(d) Real-time analytics

(v) Identify the **odd one out** from the core components of the neural network: [1]

(a) Weights
(b) Bias
(c) Activation function
(d) Convolutional layer

(vi) Refer to the diagram that illustrates the five stages of a story arc—Exposition, Rising Action, Climax, Falling Action, and (?). What term should replace the question mark (?)? [1]
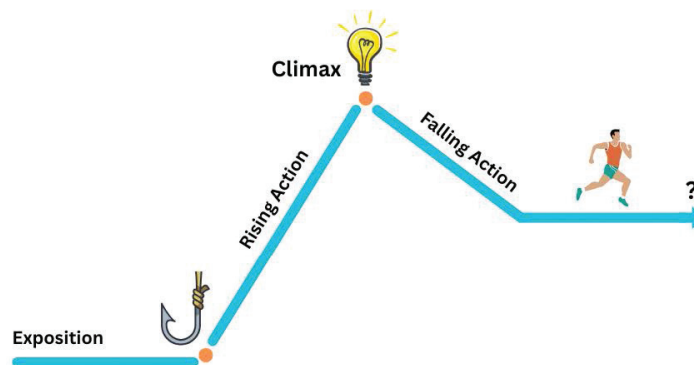
## 4. Answer any 5 out of the given 6 questions. 5 x 1 = 5

(i) **Assertion (A):** The Business Understanding phase helps data scientists clearly define the goal of the project and identify what problem needs to be solved. [1]

Reason (R): In this phase, data is collected, cleaned and transformed so that it can be used for building machine learning models.

(a) Both A and R are correct and R is the correct explanation of A.
(b) Both A and R are correct but R is not the correct explanation of A.
(c) A is correct but R is incorrect.
(d) A is incorrect but R is correct.

(ii) [1]
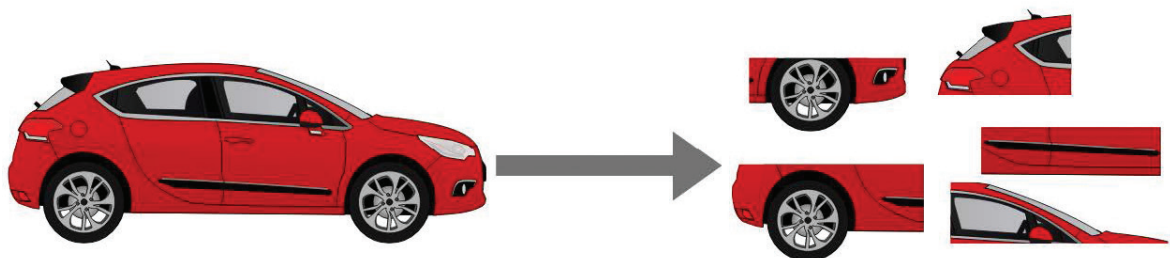
When a computer analyzes an image, it breaks it down into important features such as edges, shapes and key regions to understand what the object represents. This process is known as _____.

(iii) Which technology in big data analytics enables the distributed storage and processing of large datasets across a cluster of computers, making it easier to handle vast amounts of data? [1]

(a) HADOOP
(b) Edge computing
(c) Machine learning
(d) Social networking

(iv) Which part of a neural network neuron helps it learn complex patterns by adding non-linearity? [1]
    (a) The weighted sum of inputs   (b) The bias
    (c) The activation function   (d) The input values

(v) Name any two activation functions used in neural networks. [1]

(vi) Match the AI tool in Column A with the correct scenario in Column B. [1]

Column A	Column B
1. DALL·E 3	(a) A student wants to write an essay for reference purposes.
2. GPT	(b) A science teacher wants to create a website for students with visual explanations.
3. Claude 4	(c) A student wants to add unique, copyright-free images to a blog post.
4. Meta's AI Voicebox	(d) A student wants to convert text into speech.

    (a) 1-d,   2-b,   3-a   4-c
    (b) 1-b,   2-c,   3-a   4-d
    (c) 1-a,   2-b,   3-d   4-c
    (d) 1-c,   2-a,   3-b   4-d

5. Answer any 5 out of the given 6 questions.   5 x 1 = 5

(i) Deployment is the stage where we compare our performance based on the test set and check its usefulness in real-world settings. *(State whether this is True or False)* [1]

(ii) **Assertion (A):** A computer vision system can reliably distinguish a toy car from a real car only by analyzing the object's extracted features, like edges and shapes. [1]

    Reason (R): Contextual understanding, which considers an object's surroundings and relationships with other objects, is essential for resolving ambiguity and improving recognition accuracy.

    (a) Both A and R are correct and R is the correct explanation of A.

    (b) Both A and R are correct but R is not the correct explanation of A.

    (c) A is correct but R is incorrect.

    (d) A is incorrect but R is correct.

(iii)
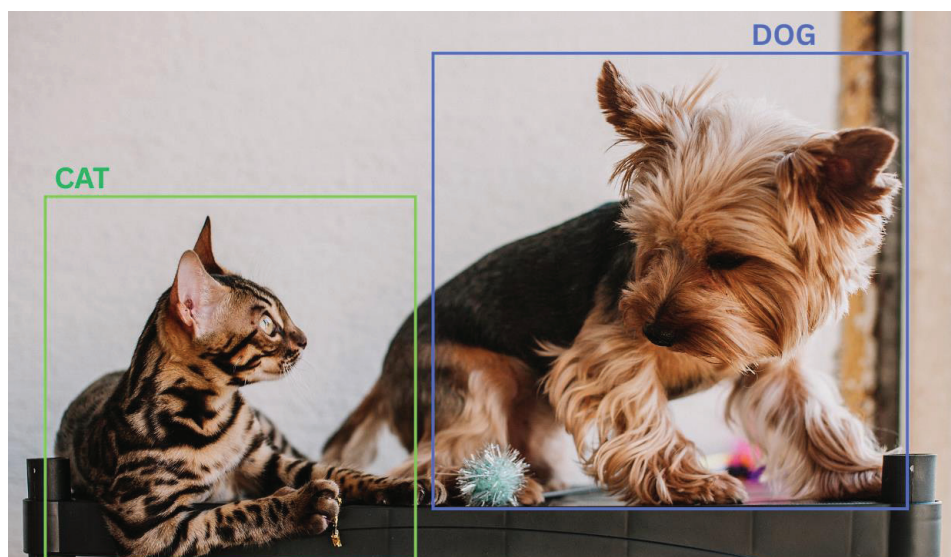
The image shows bounding boxes and labels for multiple objects. Which computer vision task does this illustrate? [1]

    (a) Image Classification   (b) Object Detection

    (c) Image Segmentation   (d) Instance Segmentation

(iv) Match the type of neural network in Column A with its key strengths in Column B. [1]

Column A	Column B
1. Recurrent Neural Network	(a) Simplicity and speed
2. Feed Forward Neural Network	(b) Automatic feature extraction in visual data
3. Convolutional Neural Network	(c) Remembers past input

(a) 1-c, 2-a, 3-b

(b) 1-b, 2-a, 3-c

(c) 1-a, 2-c, 3-b

(d) 1-b, 2-c, 3-a

(v) _____ models are designed to create new data that looks and feels like the original data fed to the models. [1]

(vi) Which chart type would be most effective for visualizing the population density across different geographical areas of a country? [1]

(a) Pie Chart   (b) Scatter Plot   (c) Line Chart   (d) Heatmap

SECTION B—SUBJECTIVE TYPE QUESTIONS

Answer any 3 out of the given 5 questions on Employability Skills.   **3 x 2 = 6**

Answer each question in 20–30 words.

6. The words 'Tall', 'Short', 'Beautiful' and 'Interesting' are examples of which part of speech? Explain their function in communication. [2]

7. Write any two steps a person can take to achieve self-awareness. [2]

8. In a spreadsheet, you can sort the data to arrange the rows/columns in ascending or descending order based on a specific criterion. [2]

   (a) Name this feature of a spreadsheet.

   (b) Which toolbar option is commonly used to apply this feature?

9. Identify the type of attitude the following entrepreneurs are demonstrating: [2]

   (a) Raghav wants to create an online tutoring platform. Although he faces criticism from some relatives who believe it won't work, he remains confident in his idea. He prepares a clear plan, gathers feedback from teachers and finally launches his platform despite initial doubts from others.

   (b) Priya runs a small home-based bakery. One evening, her oven stops working just before a big order. Instead of cancelling, she quickly arranges to use her neighbour's oven and stays up late to finish all the cakes on time, ensuring her customers are not disappointed.

10. What is meant by agroforestry? How does it help in reducing carbon footprints? [2]

Answer any 4 out of the given 6 questions in 20–30 words each.   **4 x 2 = 8**

11. Define the Design Thinking Framework. How many steps are there in it? [2]

12. Computer vision, a vital part of artificial intelligence, relies on accurate model training to understand visual patterns. Explain any two challenges faced during the training of computer vision models. [2]

13. Differentiate between HADOOP and Spark. [2]

14. Consider the following perceptron that predicts whether or not a car is suitable for driving with inputs, weights and a bias of 1000. Calculate Output/Predicted outcome ($ŷ$) for the given scenario. [2]

| Factor	Input	Weight
Manufacturing Year	2010	8
Last Serviced Year	2014	2
Miles Driven	10000	-10

15. Differentiate between parameter initialization and updating parameter in neural networks. [2]

16. List all the key elements of Freytag's pyramid. [2]

Answer any 3 out of the given 5 questions in 50–80 words each. **3 x 4 = 12**

17. Understanding the role of Data Analytics is essential for interpreting and solving real-world problems. Draw and explain a chart that classifies the four main types of Data Analytics—Descriptive, Diagnostic, Predictive and Prescriptive—and write the specific question that each type answers. [4]

18. An Electric Vehicle (EV) company collects data from thousands of smart cars across the country. Identify the characteristics of Big Data in the following scenarios below and explain each in detail: [4]

(a) Each EV continuously sends battery status, motor temperature, GPS location and driving speed to the company's servers every second.

(b) The analytics team uses the collected data to optimize battery performance, predict maintenance needs and improve the overall driving experience for customers.

(c) Some cars transmit incomplete or inconsistent sensor readings, which must be verified and corrected before the data can be used.

(d) Driving patterns change based on weather, traffic conditions, road quality and individual driving behaviour, making the data challenging to analyze due to frequent fluctuations.

19. Explain the role of neural networks in the future of AI and its impact on society. [4]

20. Draw and explain the architecture of a neural network. [4]

21.
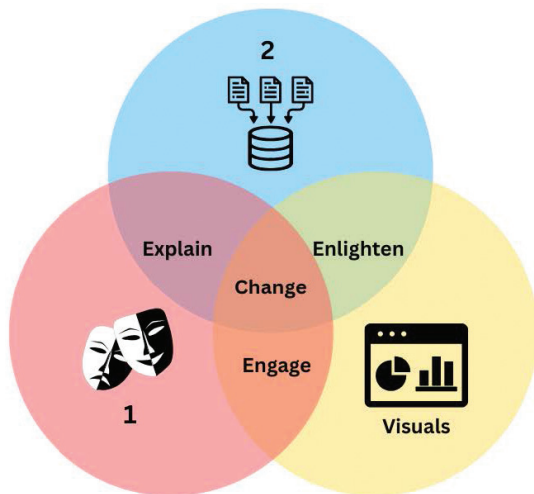
The diagram illustrates the key components of data storytelling.

Visuals transform complex data and help bring them to life. Identify and explain all the essential elements in the diagram.