PRACTICE PAPER-2
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 class discussion, Rohan is presenting an idea while Neha is checking her phone and occasionally talking to her friend. When the teacher asks Neha a question about Rohan's point, she looks confused because she wasn't listening carefully. [1]

   If Neha wanted to follow the **P** of **RESPECT** in active listening, what should she do?
   (a) Nod occasionally, but continue checking her messages.
   (b) Think about what she will say next while Rohan is speaking.
   (c) Interrupt to ask unrelated questions to stay engaged.
   (d) Focus completely on the speaker and avoid distractions like her phone.

   (ii) People with a high degree of _____ are kind, cooperative and compassionate. [1]

   (iii) Match the following personality disorders with the correct description.

Disorder	Description
1. Narcissistic Personality	(a) They lack confidence in their own abilities and have difficulties making their own decisions.
2. Schizoid Personality	(b) They possess immense sense of self-importance and lack of empathy for others.
3. Dependent Personality	(c) They prefer solitary activities and may appear emotionally cold to others.

   (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 a Slide Master in LibreOffice Impress used for? [1]
   (a) Adding a new slide
   (b) Changing the layout of individual slides
   (c) Defining the design and layout of all slides
   (d) Rearranging slides

(v) **Assertion (A):** Successful entrepreneurs are often innovative and willing to take calculated risks.   [1]
   Reason (R):   Innovation helps entrepreneurs identify new opportunities, while risk-taking enables them to turn those opportunities into successful ventures.
   (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) 'Precision Agriculture' and 'Appropriate Technology' are similar concepts, as both exclusively utilize simple, low-cost technologies to create green jobs in rural areas. *(State whether 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 Analytics in Column B.   [1]

Column A	Column B
1. How will the finished model be integrated into the software?	(a) Modelling
2. How should missing values be handled and data types be corrected?	(b) Data Preparation
3. Which predictive algorithm will provide the most accurate forecast?	(c) Data Understanding
4. What patterns, trends or outliers can be found in the data?	(d) Deployment

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

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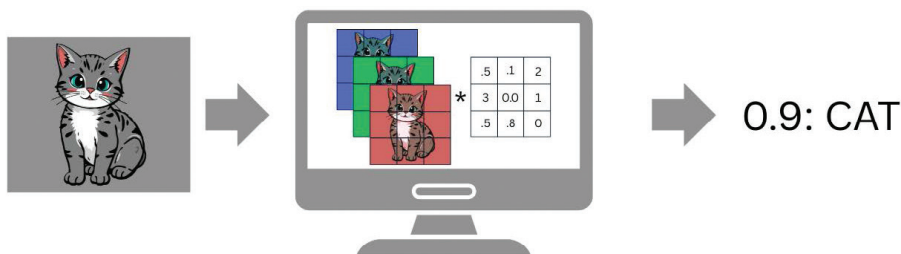
   The given image shows a vision-based model in action. Identify which task is being performed.   [1]

(iii) Which advancement in computing enables flexible scaling of resources at a lower cost, without requiring extensive IT infrastructure investment?   [1]

   (a) Edge Computing   (b) Quantum Computing
   (c) Mobile Computing   (d) Cloud Computing

(iv) In a 'Neural Network', the _____ layer receives raw or preprocessed inputs but does not perform any calculations itself.   [1]

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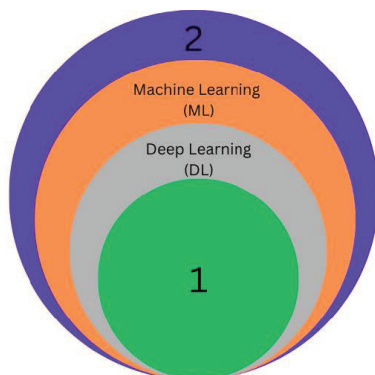
   What will come in place of '1' and '2'?   [1]

(vi) In the context of Freytag's Pyramid, which part of the plot represents the most suspenseful moment or turning point in data storytelling? [1]
    (a) Exposition   (b) Climax
    (c) Resolution   (d) Rising Action

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

(i) _____ is the phase in which a trained model is tested on a set of test data to check how well it performs in real-life scenarios. [1]

(ii) [1]

Design Thinking

Empathize   1   Ideate   Prototype   2
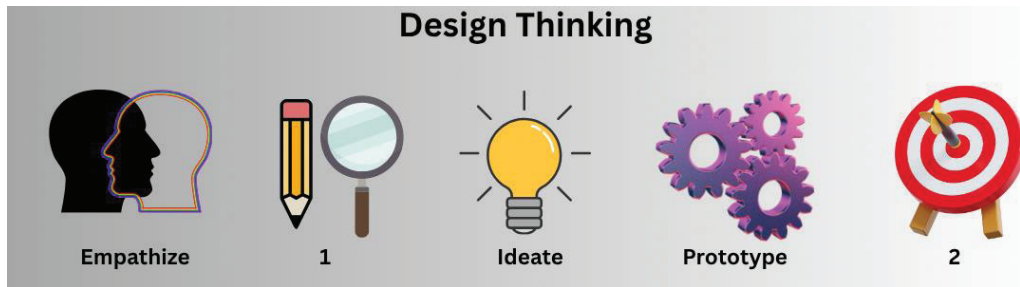
What will come in place of '1' and '2'?
    (a) Define, Test   (b) Test, Define
    (c) Define, Target   (d) Iterate, Test

(iii) Match the processing techniques in Column A with their correct description in Column B. [1]

Column A	Column B
1. Geometric Transformation	(a) Modifying an image colour to maintain colour accuracy and consistency
2. Data Augmentation	(b) Refers to unwanted distortions or variations in pixel value that reduce image quality
3. Noise Reduction	(c) Is a part of the preprocessing pipeline, used to increase the size of training data by modifying existing data
4. Color Correction	(d) Modifying an image by changing its shape/orientation without altering its content

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

(iv) Polystructured data refers to data that combines multiple formats within the same system or application. Which of the following is **NOT** an example of polystructured data? [1]

    (a) A social media app that saves photos, comments and likes.
    (b) A database that stores only rows and columns of numbers.
    (c) An IoT platform collecting sensor readings, log files and video feeds.
    (d) A system that stores text, images and videos together.

(v) Identify the **odd one out** from the following components of a neural network: [1]
    (a) Input Layer   (b) Hidden Layer
    (c) Sigmoid function   (d) Output layer

(vi) Refer to the Venn diagram that illustrates the three key elements. It includes Data and Visuals as two elements. What term should replace the question mark (?) to complete the diagram? [1]
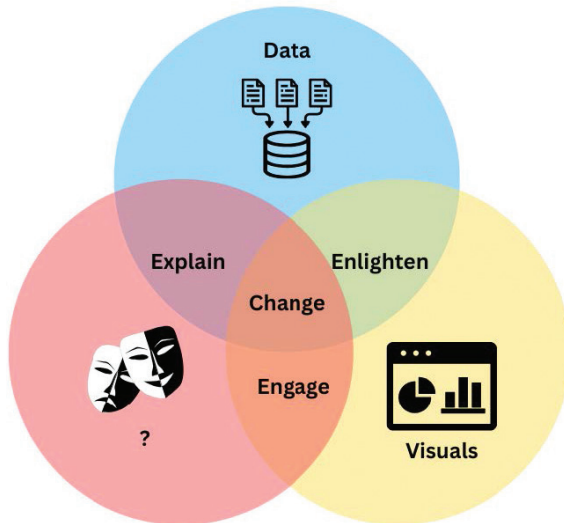

4. Answer any 5 out of the given 6 questions. 5 x 1 = 5

(i) **Assertion (A):** The primary purpose of a validation dataset in a three-way split is to aid in hyperparameter tuning and model selection. [1]

    Reason (R): By evaluating the model on unseen validation data during development, developers can make informed decisions to optimize the model before the final test.

(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.
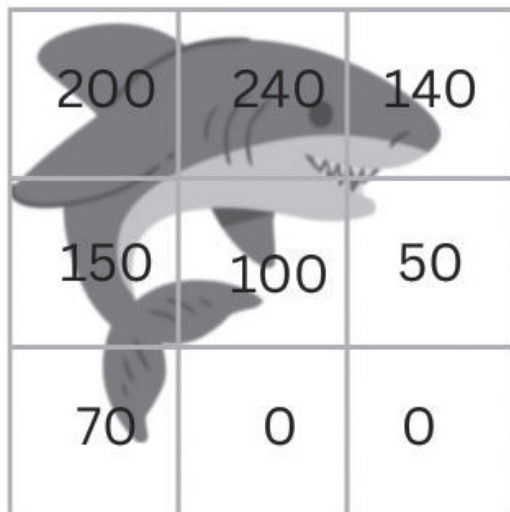
(ii) [1]

When a computer processes an image, each tiny square is assigned a number that represents how light or dark that part of the image is. These numbers are known as _____.

(iii) Which type of big data analytics involves examining historical data to understand trends, patterns, etc? [1]

(a) Predictive Analysis   (b) Descriptive Analysis

(c) Prescriptive Analysis   (d) Diagnostic Analysis

(iv) Given inputs 'x', weights 'w', bias 'b', and an activation function 'f', what is the correct representation of a neuron's output 'y'? [1]

(a) $y = f(\Sigma(x_i + w_i)) + b$ (b) $y = f(\Sigma(w_i * x_i)) + b$

(c) $y = f(\Sigma(w_i * x_i) + b$ (d) $y = \Sigma(fw_i * x_i) + b$

(v) Name any two types of neural networks. [1]

(vi) Match each Generative AI concept in Column A with its correct description in Column B. [1]

Column A	Column B
1. Generative Adversarial Network	(a) These models are used mainly for classification or decision-making tasks; they do not generate new content.
2. Discriminative Model	(b) A type of neural network trained on huge datasets to understand and generate human language.
3. Large Language Model (LLM)	(c) These models generate new variations of data by compressing the training data.
4. Variational Autoencoders (VAEs)	(d) These models are used to generate realistic images using a generator and a discriminator network.

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

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

(i) The 'CRISP-DM' approach for Data Analytics breaks down a project into different phases, each designed to guide practitioners from understanding the business problem to deploying a solution. *(State whether this is True or False)* [1]

(ii) **Assertion (A):** Object detection is a more comprehensive task than image classification [1]
   Reason (R): Unlike classification, which only assigns a label to an entire image, object detection also identifies the specific location of one or more objects using bounding boxes.
   (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)
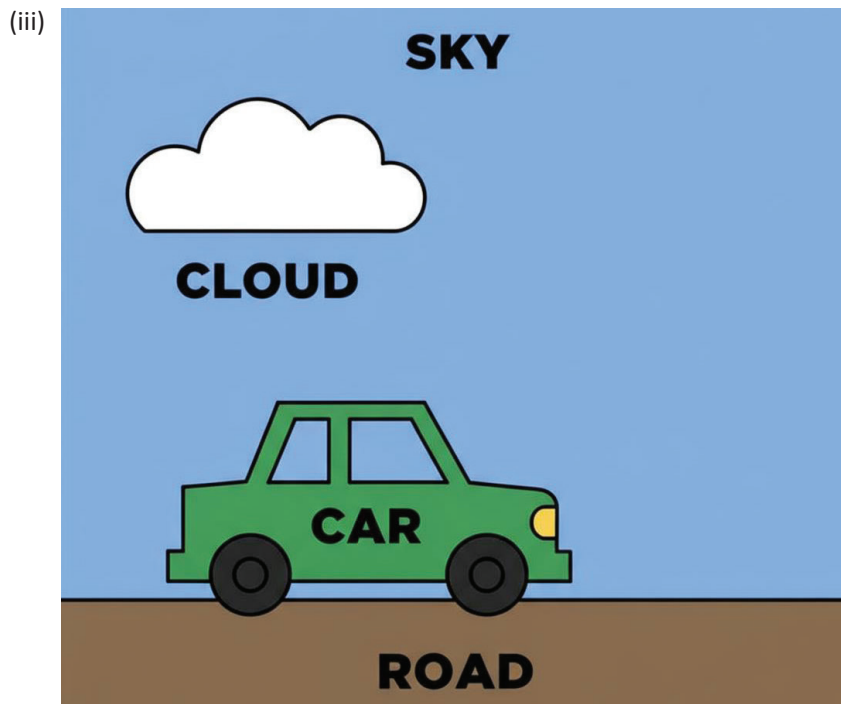
Which computer vision task does this represent? [1]
   (a) Image Classification (b) Object Detection
   (c) Instance Segmentation (d) Semantic Segmentation

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

Column A	Column B
1. Perceptron	(a) Binary classification
2. Feed Forward Neural Network	(b) Image generation
3. Generative Adversarial Network	(c) House price prediction

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

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

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

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

(v) The constraint that limits how much text a model can process and 'remember' at one time is known as the _____ limit. [1]

(vi) A chart used to show the overall trend of price movement over a period of time by connecting data points with a continuous line is called a _____. [1]

(a) Line chart   (b) Bar chart

(c) Facet grid chart   (d) Candlestick chart

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. 'John' 'Delhi' 'Pen' 'Freedom'

   In the context of English Grammar, what are these words known as? Explain. [2]

7. Write any two health benefits associated with maintaining a positive attitude. [2]

8. In a spreadsheet, you can filter the data to display only the rows/columns that meet a certain criterion while temporarily hiding the rest. [2]

   (a) Name this feature of a spreadsheet.

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

9. Identify the qualities demonstrated by the following entrepreneurs: [2]

   (a) Aman Gupta, one of the co-founders of 'boAt', previously served as the Director of Sales at Harman International, where he earned a significant income. Recognizing a gap in the market, he decided to leave his job and establish a new company in 2016 called 'boAt'. Today, 'boAt' has become a household name and boasts of a multi-crore turnover.

   (b) Kiran Mazumdar-Shaw started Biocon in her garage in 1978 after facing gender bias and scepticism about her capabilities as a woman entrepreneur in the biotechnology field. She was undeterred by limited capital and professional resistance and went on to build Biocon, transforming it into a global biopharmaceutical leader.

10. What are green jobs? How do they help in addressing climate change? [2]

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

11. What is the primary purpose of Data Science Methodology? List any two of the seven sequential phases of it. [2]

12. Image acquisition, a crucial step in computer vision systems, encounters multiple difficulties while capturing visual data from the environment. Explain any two challenges related to image acquisition. [2]

13. Differentiate between Sliding Window and Reservoir Sampling for managing data streams. [2]
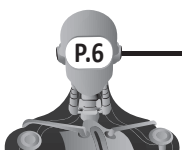
14. Consider the following perceptron that predicts whether or not a house is suitable for living (for a family of four) using the given inputs, weights and a bias of 5. Calculate the output/predicted outcome ($\hat{y}$) for the given scenario. [2]

| Factor	Input	Weight
Area	505	5
Window	2	1
Bedroom	3	2

15. What distinguishes the Generative Model from the Discriminative Model? [2]

16. Describe the three main elements that make up data storytelling. [2]

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

17. A Confusion Matrix is used to evaluate the performance of a classification model. Draw and label a standard 2x2 Confusion Matrix and explain the difference between True Positive (TP), False Positive (FP), True Negative (TN) and False Negative (FN) based on the relationship between the Predicted and Actual classes. [4]

18. A large retail company uses Big Data analytics to improve its operations and customer satisfaction. Identify the types of Big Data analytics demonstrated in the following scenarios and explain them in detail: [4]

    (a) The company examines last year's sales data to understand which products sold the most during festive seasons.

    (b) Using current sales and inventory data, the company creates dashboards to track daily performance and identify stores with low stock.

    (c) Analysts use machine learning models to forecast future demand for products based on trends and customer behaviour.

    (d) The marketing team recommends discount strategies and personalized offers to increase sales based on predictive insights.

19. Explain the different phases of learning in a neural network in detail. [4]

20. Explain the hierarchical relationship between Artificial Intelligence, Machine Learning, Deep Learning and Generative AI with the help of a diagram. [4]

21. [4]
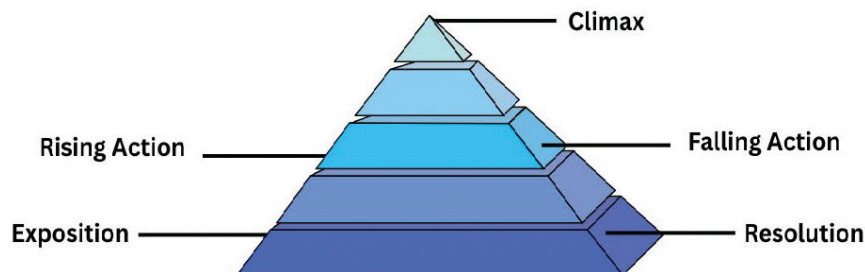
The image illustrates Freytag's Pyramid, a classic narrative structure.

Resolution wraps up the story. Explain the other stages in the diagram. How does this differ from a traditional story's climax?