Section-A

Q1. Answer the given questions on Employability Skills (1 x 4 = 4 marks)

i. During a class activity, Anika is sharing her idea with the group. Ritu listens carefully, looks at Anika while she speaks, and nods to show she is paying attention. Which action shows that Ritu is following the S of RESPECT in active listening?

a) Looking around the room while Anika talks
b) Checking her phone during the discussion
c) Showing she cares by giving attention through eye contact and nodding
d) Interrupting to share her own idea

ii. _____ is a trait wherein individuals mix up easily with each other. They make friends quickly and easily.

iii. Match the following skills with their correct descriptions:

Skills	Description
1. Creative thinking	a. Ability to adjust to new situations and challenges.
2. Problem Solving	b. Ability to generate new ideas and innovative solutions..
3. Adaptability	c. Ability to find solutions to difficulties or obstacles.

a) 1 → b, 2 → c, 3 → a
b) 1 → a, 2 → b, 3 → c
c) 1 → b, 2 → a, 3 → c
d) 1 → c, 2 → a, 3 → b

iv. What happens when you apply a transition to a slide in a presentation?

a) A special visual effect is added between slides
b) The layout of the slide changes
c) The text formatting automatically changes
d) Visual effect added to the slide contents

Q2. Answer the given questions (1 x 5 = 5 marks)

i. A retail store wants to improve its monthly sales. The owner collects data about customers, products, and purchases. She now wants to understand the problem clearly and decide how the data can help her. Match the Columns

Column A	Column B
1. What exactly is causing the drop in monthly sales?	a. Data Understanding
2. From where should the store collect customer and product data?	b. Business Understanding
3. How can charts or dashboards be used to find sales patterns?	c. Analytic Approach
4. Do the collected purchase records represent all types of customers?	d. Data Collection

a) 1 → a, 2 → b, 3 → c, 4 → d
b) 1 → d, 2 → c, 3 → b, 4 → a
c) 1 → b, 2 → d, 3 → c, 4 → a
d) 1 → c, 2 → b, 3 → a, 4 → d

ii. The given diagram shows the working of a system. What is name for this technology?



iii. Which law suggests that increasing computing power over time makes it easier to handle large volumes of data?

a) Boyle's Law b) Murphy's Law c)Newton's Law d) Moore's Law

iv. When a mobile keyboard predicts the next word you are about to type by remembering the previous words in your sentence, it is using a type of neural network called a _____.

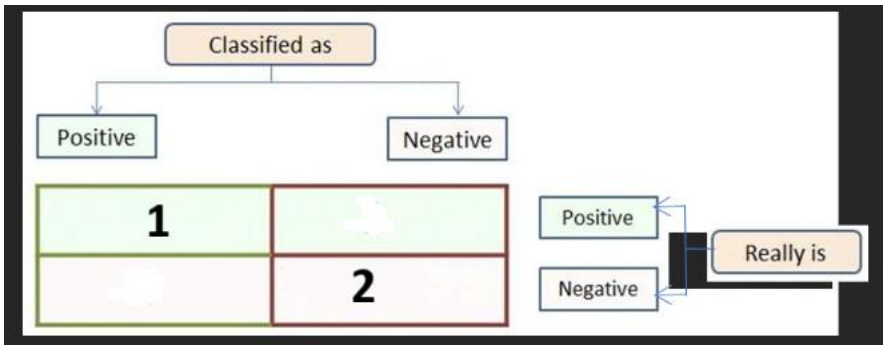
v. A clothing brand uses an AI tool to design new T-shirt patterns based on past best-selling designs. The AI creates completely new artwork that never existed before. Which type of AI is being used here?

a) Predictive AI b) Generative AI c) Reinforcement Learning d) Classification Model

Q3. **Answer the given questions (1 x 5 = 5 marks)**

i. The _____ algorithm predicts the class of a new data point by looking at the closest labeled data points in the feature space.

ii.



What will come in place of 1 and 2?

a) True Positive, False Positive b) False Positive, True Negative

c) True Negative, False Negative d) False Negative, False Positive

iii. Match the image processing technique in Column A with its correct description in Column B

Column A	**Column B**
1. Image Segmentation	a. Aligns two or more images of the same scene
2. Object Recognition	b. Identifies specific objects within an image
3. Feature Matching	c. Divides image into distinct regions or segments
4. Image Registration	d. Finds corresponding points between images

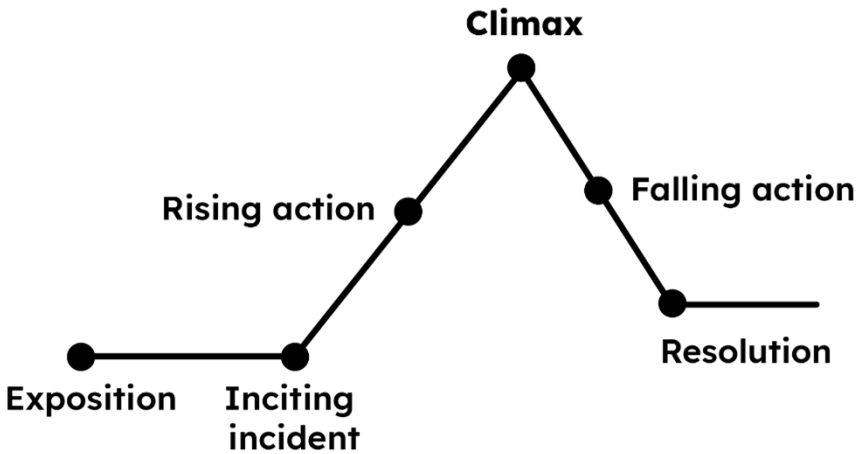
a) 1 → a, 2 → b, 3 → c, 4 → d b) 1 → a, 2 → c, 3 → b, 4 → d

c) 1 → b, 2 → a, 3 → c, 4 → d d) 1 → c, 2 → b, 3 → d, 4 → a

iv. Identify the odd one out from the following activation functions:

a) Confusion Matrix b) Mean Squared Error c) ReLU d) Linear Regression

v. What does the following diagram represent:



Q4. Answer the given questions (1 x 5 = 5 marks)

i. Assertion (A): Predictive analysis helps forecast future outcomes based on historical data patterns.

Reason (R): Prescriptive analysis only describes past events and does not provide any recommendations for future actions.

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. Which colour is formed by R=255, G=255, B=255.

iii. Which technology allows organizations to store and process massive volumes of Big Data on remote servers, enabling scalability, flexibility, and cost-effective on-demand computing?

a) Quantum Computing b) Edge Computing c) Cloud Computing d) Blockchain

iv. In an Artificial Neural Network, which element determines the output of a neuron based on the weighted sum of its inputs?

a) Cost function b) Activation function c) Dropout layer d) Pooling layer

v. Match the type of Generative AI application to the correct AI tool.

Column A – Generative AI Application	**Column B – AI Tool**
1. Text Generation	a. GitHub Copilot
2. Image Creation	b. DALL·E / Midjourney
3. Music Composition	c. ChatGPT
4. Code Generation	d. AIVA / Amper Music

a) 1 → c, 2 → d, 3 → a, 4 → b b) 1→ a, 2 → c, 3 → b, 4 → d
c) 1 → d, 2 → b, 3 → c, 4 → a d) 1 → c, 2 → b, 3 → d, 4 → a

Q5. Answer the given questions (1 x 5 = 5 marks)

i. Assertion (A): Computer Vision systems sometimes fail to correctly identify objects in low-light or blurry images.

Reason (R): Computer Vision models rely heavily on clear visual features such as edges, colors, and textures to make accurate predictions.

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. A computer vision model identifies three people in an image and draws separate outlines around each person, even though they all belong to the same category. Each individual is marked as a unique object with its own mask. Which computer vision task is being performed?

a) Image Classification b) Semantic Segmentation
c) Instance Segmentation d) Object Tracking

iii. Match the type of neural network in Column A with its corresponding task in Column B

Column A	**Column B**
1. Artificial Neural Network (ANN)	**a. Generating synthetic images or data**
2. Generative Adversarial Network (GAN)	**b. Sequence-based tasks like text processing**
3. Recurrent Neural Network (RNN)	**c. General prediction or classification**

a) 1 → c, 2 → a , 3 → b b) 1 → a, 2 → b, 3 → c
c) 1 → b, 2 → c, 3 → a d) 1 → c, 2 → b, 3 → a

iv. _____ is the compressed representation of the actual data in Variational Autoencoders.

v. A chart that shows the relationship between two numerical variables using dots plotted on the x–y axis is called a _____.

a) Line chart b) Bar chart c) Scatter plot d) Area chart

SECTION B

Answer the given questions in 20 – 30 words (2 x 3 = 6 marks)

Q6. Write the difference between paranoid personality disorder and schizoid personality disorder.

Q7. a) **Raghav noticed that many elderly people in his neighbourhood struggled to buy groceries during the rainy season. He came up with an idea to start a home-delivery service, even though others told him it might not work. He believed in his idea and began the service with confidence.**

b) **Neha runs a homemade snack business. When customers complained about delayed deliveries,**

she immediately took responsibility, apologized, and reorganized her delivery schedule to ensure timely service.

Q8. What is e-waste management, and why is it important to handle electronic waste properly?

Answer the given questions in 20 – 30 words. (2 x 4 = 8 marks)

Q9. What do you know about Modelling & Evaluation phase data science methodology?

Q10. Natural Language Processing (NLP), an important field of artificial intelligence, deals with understanding human language. Explain any two challenges related to NLP.

Q11. A hospital uses a simple perceptron model to predict whether a tumor is likely to be malignant or benign. The model takes three inputs, each multiplied by its respective weight, and includes a bias of –5.

Medical Factor	Input (x)	Weight (w)
Tumor Size (large = 1, small = 0)	1	4
Cell Shape Abnormality (present = 1, absent = 0)	1	3
Age Risk (high = 1, low = 0)	0	2

Q12. Why is ethics important in data storytelling? Mention any two ethical practices that should be followed while presenting data.

Answer the given questions in 50– 80 words each (4 x 3 = 12 marks)

Q13. A large smart city management system collects data from various sources to improve city operations. Identify the Big Data characteristics involved in the following situations and explain them in detail:

a) Thousands of sensors across the city continuously record traffic flow, air quality levels, energy usage, and emergency alerts every second.

b) The system stores years of historical data, including CCTV footage, traffic density reports, pollution readings, weather patterns, and power consumption logs.

c) The city receives data in multiple formats — structured (traffic signal timings), semi-structured (sensor logs), and unstructured (video surveillance, audio recordings).

d) Before using the data for planning and decision-making, the system cleans missing values, fixes incorrect sensor readings, and removes inconsistent or corrupted data entries.

Q 14. A machine learning team developed a regression model to predict the quarterly sales (in thousands of dollars) for five regional offices.

Given the following sample of Actual Sales () and the model's Predicted Sales (), Calculate the three primary regression evaluation metrics: Mean Absolute Error (MAE), Mean Squared Error (MSE), and Root Mean Squared Error (RMSE).

Observation (Office)	Actual Sales (y)	Predicted Sales (y^)
1	10	9.5
2	15	16.0
3	20	18.0
4	5	6.0
5	12	12.5

Q15. What is LLM? Why are they called large? What are transformers in LLM? Explain any two popular LLMs.