

PRACTICE PAPER-1

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

(1 × 4 = 4 marks)

- (a) When communication involves spoken words in face-to-face conversations, phone calls or speeches, which type of communication is being used?
 - (i) Verbal Communication
 - (ii) Visual Communication
 - (iii) Written Communication
 - (iv) Sign Language
- (b) Riya has a project submission tomorrow. Instead of delaying it, she divides the work into smaller tasks and completes each one on time. Which self-management skill is she demonstrating?
 - (i) Stress Management
 - (ii) Time Management
 - (iii) Teamwork
 - (iv) Decision Making
- (c) Which of the following best reflects effective goal setting as a self-management technique?
 - (i) Setting goals that are very easy to achieve to avoid failure
 - (ii) Setting goals that are vague and adaptable to any situation
 - (iii) Setting goals that are specific, measurable, achievable, relevant and time-bound
 - (iv) Setting goals based on what others expect rather than personal priorities
- (d) What action are you performing when you quickly press and release the left mouse button once to select a file?
 - (i) Double-click
 - (ii) Right-click
 - (iii) Single Click
 - (iv) Drag and Drop
- (e) An entrepreneur launches a tech product after thorough market research and continues to refine features based on regular feedback from diverse user groups, including early adopters, sceptics and international clients. Which advanced entrepreneurial skill is primarily being demonstrated?
 - (i) Static business planning
 - (ii) Reactive crisis management
 - (iii) Dynamic adaptability through customer-centric innovation
 - (iv) Passive product improvement
- (f) Providing free health check-ups and promoting vaccination programs in communities contribute to which of the following Sustainable Development Goals?
 - (i) SDG 3 – Good Health and Well-being
 - (ii) SDG 7 – Affordable and Clean Energy
 - (iii) SDG 5 – Gender Equality
 - (iv) SDG 11 – Sustainable Cities and Communities

2. Answer any 5 out of the given 6 questions.

(1 x 5 = 5 marks)

- (a) The AI domain that allows machines to analyze and understand images, videos and visual information is known as
- (b) **Assertion (A):** Sector-based ethical framework focuses on applying ethical guidelines differently depending on the area where AI is used, such as healthcare, education or finance.
Reason (R): This is because each sector has the same rules, priorities and ethical expectations in every situation.
 - (i) Both A and R are correct and R is the correct explanation of A.
 - (ii) Both A and R are correct but R is not the correct explanation of A.
 - (iii) A is correct but R is incorrect.
 - (iv) A is incorrect but R is correct.
- (c) A chatbot is programmed with fixed responses. It works well when users ask simple, expected questions. But when a user types the same question in a different sentence structure, the chatbot fails to understand it. What is the reason for this?
 - (i) The chatbot has a very powerful language model.
 - (ii) Rule-based systems cannot understand variations in language.
 - (iii) The user types too quickly.
 - (iv) The chatbot has too many rules.
- (d) After building and testing an AI model, the stage where the model is integrated into a real-world system and continuously monitored for performance is called
- (e) is the task of identifying *what* objects are present in an image, while identifies *where* those objects are located within the image.
 - (i) Object Detection; Image Classification
 - (ii) Image Classification; Object Detection
 - (iii) Image Segmentation; Image Classification
 - (iv) Face Recognition; Optical Character Recognition
- (f) State whether the given statement is True or False:
Lemmatization may produce words that are not actual dictionary words, while Stemming ensures that the output is a valid meaningful word.

3. Answer any 5 out of the given 6 questions.

(1 x 5 = 5 marks)

- (a) Riya is developing a job recommendation platform. The system analyzes job descriptions and candidate resumes by extracting keywords, comparing skill sets and then predicting the best match score based on patterns learned from previous hiring data.
Which of the following AI domains are mainly involved?
 - (i) Computer Vision and Natural Language Processing
 - (ii) Natural Language Processing and Statistical Data Domain
 - (iii) Statistical Data Domain and Computer Vision
 - (iv) Speech Recognition and Computer Vision
- (b) What type of data includes a tag or name attached to each item, as shown with the dog and cat images?



Dog



Dog



Cat



Cat

(i) Raw data

(ii) Labelled data

(iii) Unlabelled data

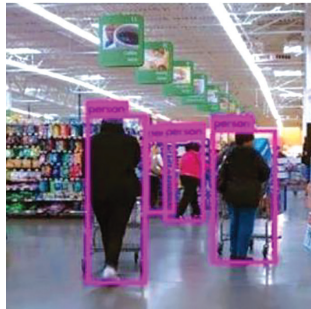
(iv) Numeric data

- (c) A model is used to check whether fruits are ripe before packaging. Out of 500 fruits, the model correctly identifies 350 ripe fruits and 100 unripe fruits. However, it misclassifies 30 ripe fruits as unripe and 20 unripe fruits as ripe. What is the Accuracy of the model?
- (i) 0.90 (ii) 0.85
 (iii) 0.88 (iv) 0.95

(d) **Assertion (A):** Precision is more important than Recall in medical diagnosis systems.

Reason (R): In medical diagnosis, it is crucial to correctly identify as many actual positive cases as possible to avoid missing a patient who has the disease.

- (i) Both A and R are correct and R is the correct explanation of A.
 (ii) Both A and R are correct but R is not the correct explanation of A.
 (iii) A is correct but R is incorrect.
 (iv) A is incorrect but R is correct.
- (e) Identify the application of Computer Vision from the given picture:



- (i) Facial Recognition (ii) CV in Retail
 (iii) Medical Imaging (iv) Face Filters
- (f) Read the sentence below and count the number of unique words (case-insensitive) after removing punctuation and stop words:
 ‘Artificial intelligence helps machines learn patterns and intelligence allows machines to improve decisions.’

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

- (a) Which ethical framework emphasizes moral character, asking whether a person is acting with qualities like honesty, kindness and integrity?
- (i) Virtue-based framework (ii) Rights-based framework
 (iii) Utility-based framework (iv) Sector-based framework

(b) **Statement 1:** If the model performs very well on training data but poorly on testing data, it may be overfitting.

Statement 2: Overfitting means the model has generalized well to new data.

Which of the following is correct?

- (i) Both Statement 1 and Statement 2 are correct.
 (ii) Both Statement 1 and Statement 2 are incorrect.
 (iii) Only Statement 1 is correct.
 (iv) Only Statement 2 is correct.
- (c) An online store uses a simple algorithm to recommend products to users. Four features are evaluated and assigned importance:

Purchased before (1), $w=0.6$

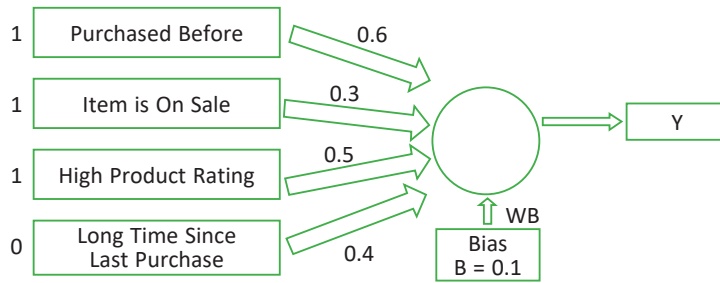
Item is on sale (1), $w=0.3$

High product rating (1), $w=0.5$

Long time since last purchase (0), $w=0.4$

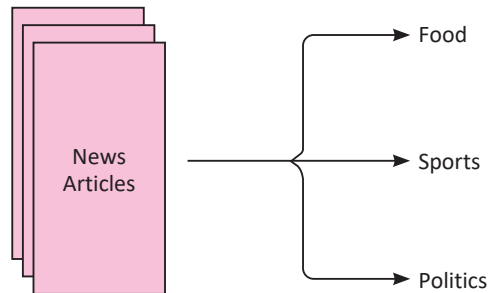
A bias value of 0.1 is added.

The formula used is: $y=w_1x_1+w_2x_2+w_3x_3+w_4x_4+(1 \times b)$



What will be the value of y for the given scenario?

- (i) 0.9
 - (ii) 1.4
 - (iii) 1.5
 - (iv) 1.9
- (d) Using only training data for both training and evaluation mainly leads to:
- (i) Higher reliability of real-world predictions
 - (ii) Reduced model complexity
 - (iii) Unrealistically high-performance scores due to memorization
 - (iv) Improved ability to detect new patterns
- (e) Which of the following best describes the resolution of an image?
- (i) The number of bits used to store each pixel
 - (ii) The total number of pixels, often given as width \times height or as a single megapixel value
 - (iii) The brightness level of each pixel
 - (iv) The number of colors an image can display
- (f) Identify the application of NLP shown in the given picture:



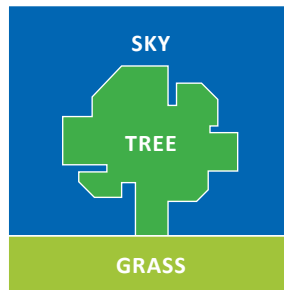
- (i) Autogenerated Captions
- (ii) Sentiment Analysis
- (iii) Text Classification
- (iv) Keyword Extraction

5. Answer any 5 out of the given 6 questions.

(1 x 5 = 5 marks)

- (a) Riya is selecting a speaker for a school event. She immediately opts for a speaker she has previously seen on social media, even though she has not reviewed the application details of other speakers. Which factor likely influenced her choice?
- (i) Media familiarity
 - (ii) Climate conditions
 - (iii) Audience size
 - (iv) Language difficulty
- (b) The weather forecasting system predicted the temperature to be 28°C, while the actual temperature was 25°C. What is the absolute error of the prediction?
- (i) 1°C
 - (ii) 2°C
 - (iii) 3°C
 - (iv) 4°C

- (c) In the image given below, different areas are marked with distinct colors to indicate boundaries of each object such as 'Tree', 'Grass' and 'Sky'. What is the correct term for this technique?



- (i) Image Segmentation
(ii) Object Tracking
(iii) Color Mapping
(iv) Classification
- (d) refers to the number of instances where a model correctly predicts the positive class.
- (e) A Script-based chatbot fails when:
- (i) The user's message matches one of its predefined patterns.
 - (ii) The user asks questions beyond its stored responses.
 - (iii) It is integrated into a messaging platform.
 - (iv) It responds using rule-based logic.
- (f) Which statement correctly describes the difference between stemming and lemmatization?
- (i) Stemming produces dictionary-valid words while lemmatization may not.
 - (ii) Lemmatization always shortens words while stemming always lengthens words.
 - (iii) Stemming may produce incomplete words while lemmatization returns meaningful base forms.
 - (iv) Stemming and lemmatization always give the same result.

SECTION B: SUBJECTIVE TYPE QUESTIONS

Answer any 3 out of the given 5 questions on Employability Skills in 20–30 words each. (2 x 3 = 6 marks)

6. What is a conjunction? Explain with an example.
7. Why is the ability to work independently important in a workplace? Give any two reasons.
8. 'Computer viruses can slow down system performance and damage files.' Explain two methods to protect a computer from viruses.
9. When Steve Jobs returned to Apple in 1997, he made bold decisions like simplifying the product line and investing in innovation (leading to the iPod and iPhone). Analyze two key entrepreneurial traits demonstrated by Steve Jobs during this time.
10. Suggest two ways students can help save water at school.

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

11. Describe the role of 'Evaluation' in the AI project cycle. Why must a model be evaluated before deployment?
12. Identify the layer of neural network component based on the description given below.
 - (a) This layer of the neural network performs computation by applying weights, biases and activation functions to data. It is not visible to the user and helps the network learn patterns.
 - (b) This layer only receives data and passes it to the network. It does not perform any processing.
13. How is clustering different from classification and regression?
14. State any two metrics commonly used to measure the performance of an AI classification model.
15. What is 'image resolution' in the context of digital images and why is it important in computer vision applications?
16. Identify the NLP stage and explain it for the following input:
"The bank was crowded."
Is 'bank' a financial institution or riverside?

Answer any 3 out of the given 5 questions in 50–80 words each.

(4 × 3 = 12 marks)

17. A genomics research company in Hyderabad offers free DNA testing to citizens, promising personalized diet and fitness recommendations.

The collected DNA samples are stored in a central database to train AI models for genetic analysis.

Later, it is discovered that the company sold anonymized genetic data to third parties without informing users. Some individuals express concern that their genetic information might be used for insurance or employment decisions.

Questions:

- (a) Identify the main ethical issues raised by this situation.
 - (b) Suggest one bioethical principle and one data privacy principle that should guide the company's actions.
 - (c) Recommend one policy or safeguard to prevent such ethical breaches in AI-based health data usage.
18. (a) What is the name of the learning model that works with unlabelled data to find patterns or structural groupings in a dataset?
- (b) Name the two main categories of this learning model.
 - (c) Explain each category briefly and give one example of each.
19. Identify the Machine Learning (ML) or Deep Learning (DL) application used in each of the following scenarios:
- (a) A music streaming app analyzes what songs you listen to at different times of the day and automatically creates personalized playlists according to your mood.
 - (b) A self-driving car notices a pedestrian crossing the road and automatically applies brakes to avoid collision.
 - (c) A bank's mobile app asks you to scan your face before logging in to confirm your identity.
 - (d) An app can convert a photo of handwritten class notes into neatly formatted digital text.
20. Read the following paragraph and answer the questions that follow:
- A company built an AI system to predict whether or not job applicants should be selected for an interview. Out of 120 applicants:
- The model correctly predicted 50 candidates would be selected and, in fact, they were selected too.
It correctly predicted 35 candidates would not be selected and they were indeed not selected.
It predicted 20 candidates would be selected but they were not selected.
It predicted 15 candidates would not be selected but they were selected.
- (a) Construct the confusion matrix.
 - (b) Calculate the accuracy of the model.
 - (c) How many total incorrect predictions were made?
21. Read the following three documents and answer the questions that follow:
- Document 1: 'Machine learning helps computers learn.'
 - Document 2: 'Deep learning is a part of machine learning.'
 - Document 3: 'Students learn deep learning models.'
- After text pre-processing (lowercase, removing punctuation, tokenizing), the documents become:
- Document 1: [machine, learning, helps, computers, learn]
 - Document 2: [deep, learning, is, a, part, of, machine, learning]
 - Document 3: [students, learn, deep, learning, models]
- Questions:**
- (a) Create the dictionary (vocabulary) of unique words from all three documents.
 - (b) Construct the document vector for Document 1 using the dictionary.
 - (c) How does Bag of Words convert text data into numerical format?
 - (d) State one limitation of the Bag-of-Words model.

