MODEL TEST PAPERS

MODEL TEST PAPER – 1

Time Allowed: 2 Hrs.   **Max. 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)**

A. Which of the following activities helps in reducing stress?

   (a) Yoga   (b) Walking   (c) Meditation   (d) All of these

B. Which of these are symptoms of a computer affected with virus?

   (a) Computer runs slowly   (b) Computer restarts on its own

   (c) Computer can't open deleted files   (d) Both (a) and (b)

C. Akriti organized a baby show at the opening of her playschool in her society. She also organized several exciting and fun competitions and games. Besides, she offered inaugural admission discounts in order to attract parents to enrol their children in her school. What quality of an entrepreneur is depicted here?

   (a) Problem-solving   (b) Dividing income

   (c) Being innovative and creative   (d) Creating jobs in the market

D. Which of these is not an operating system?

   (a) Windows   (b) Android   (c) macOS   (d) Word

E. Which of these is not a quality associated with an entrepreneur?

   (a) Perseverance   (b) Open-mindedness   (c) Overconfidence   (d) Independence

F. "High expectations from self can leave one with chronic anxiety leading to stress." What kind of stress is depicted in the above statement?

   (a) Physical   (b) Emotional   (c) Mental   (d) Financial

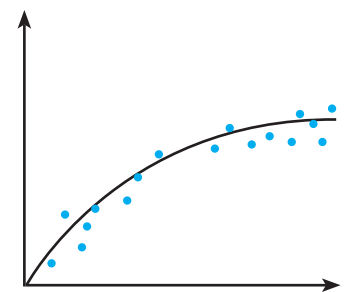2. **Answer any 5 out of the given 6 questions.** **(1 x 5 = 5)**

A. .... and .... use recommendation system to predict products and services according to user's activities, habits, likes and dislikes.

B. "People with this type of intelligence have the ability to communicate with others by understanding other people's feelings, characteristics, emotions and intentions. They are essentially a people person."

   Identify the type of intelligence described in the above statement.

C. Identify the incorrect domain-application pair from the following:
   (i) Data Science: Price Comparison websites
   (ii) Computer Vision: Image Processing Software
   (iii) Natural Language Processing: Alexa
   (iv) Artificial Intelligence: Spreadsheet
   (a) Only (iv)   (b) (i) and (iii)   (c) (ii) and (iv)   (d) (iii) and (iv)

D. An air conditioner can be turned on and off remotely with the help of the internet but still needs a human touch. This is an example of ....
   (a) Internet of Things (IoT)   (b) Artificial Intelligence
   (c) Computer Vision   (d) Data Science

E. If you search Google for salons, the first few searches are mostly for female salons. This is based on the assumption that if a person is searching for a salon, in all probability that person would be female. What is this situation depicting?
   (a) Data Privacy   (b) Data Access   (c) AI Bias   (d) AI Ethics

F. Machine Learning (ML) and Deep Learning (DL) are part of Artificial Intelligence (AI) but not everything that is Machine Learning will be Deep Learning. (True/False)

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

A. The .... helps in identifying the key elements related to scoping a problem to have a deeper understanding of it.

B. Prerna is learning how neurons in the human brain behave and how they are able to extract data features automatically without needing the input of the programmer. Which topic of Machine Learning is this?
   (a) AI Ethics   (b) Neural Network
   (c) Computer Vision   (d) Statistical Learning

C. All member nations of the UN have taken a pledge to achieve 17 Sustainable Development Goals by the end of ....
   (a) 2023   (b) 2037   (c) 2050   (d) 2030

D. Identify the algorithm based on the given graph:
   (a) Dimensionality Reduction
   (b) Classification
   (c) Clustering
   (d) Regression

E. The .... model is used to identify relationships, patterns and trends out of the random unlabelled data set which is fed into the machine and the person who is training the model does not have any information about it.
   (a) Supervised Learning   (b) Reinforcement Learning
   (c) Unsupervised Learning   (d) None of these

F. Neural Network tends to perform better with .... amount of data.
   (a) Large   (b) Small   (c) Moderate   (d) Very small

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

   A. .... is used to extract a specific piece of information such as emotional meanings while collecting data from social media. It also provides an overview of a news item or blog post while avoiding redundancy from multiple sources and maximizing the diversity of content obtained.

   B. .... takes the data in the form of natural language.

   C. Shreyas has collected some data in human language format for his NLP project. Now he wants to convert this data into a numerical format so that the computer understands it. Help him in identifying the term used for it.

   D. Name the algorithm that returns the unique words and their occurrences in the corpus.

   E. Count the total number of stop words in the following statement.

      "Humans interact with each other very easily."

      (a) 4   (b) 9   (c) 2   (d) 0

   F. Identify the type of chatbot with the information given below:

      All the assistants like Google Assistant, Alexa, Cortana, Siri, etc., can not only handle conversations but also manage to do other tasks.

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

   A. When the model always predicts correctly on the training data set and incorrectly on the test data set, this situation leads to _____. (Underfitting/Overfitting)

   B. If the F1 score of a model is _____, we can conclude that the model has a good performance.

   C. Pooja has created an AI classification model that predicts whether a mail is spam or not. She used a confusion matrix to record the output generated by the model. The model predicts mail as spam when it is spam. What is this situation called?

      (a) False Positive   (b) True Positive   (c) False Negative   (d) True Negative

   D. The formula to calculate the F1 score is:

      (a) $2 * \dfrac{\text{Precision} * \text{Recall}}{\text{Precision} + \text{Recall}}$

      (b) $\dfrac{\text{Correct Predication}}{\text{Total Causes}} * 100\%$

      (c) $2 * \dfrac{\text{Precision} * \text{Accuracy}}{\text{Precision} + \text{Accuracy}}$

      (d) $2 * \dfrac{\text{Accuracy} * \text{Recall}}{\text{Accuracy} + \text{Recall}}$

   E. When an AI-based predictive model is used, we need to check if the predictions it makes are correct or not. So, we need to check that:

      (a) Prediction and Reality are different   (b) Prediction and Reality are same

      (c) How many True cases it can predict   (d) How many False cases it can predict

   F. An AI model is supposed to predict weeds in crops but the model does not detect them correctly. This hard-to-control weed can introduce other fungi and bacteria leading to a lower yield and income for the farmer. What situation is depicted here?

      (a) False Positives can be costly   (b) False Negatives can be dangerous

      (c) Prediction matches with reality   (d) Model performance is good

SECTION B: SUBJECTIVE TYPE QUESTIONS

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

Answer each question in 20–30 words.

6. Payal is stressed due to her career and job. Has some stress in life its benefits or is all stress bad? Explain.

7. What is a computer virus? Name any two antivirus packages commonly used.

8. Write two common myths about entrepreneurship.

9. How can one enhance their ability to work independently?

10. "Society is described as an aggregate of people living together in a community who associate for various engagements including business." Explain the role of society in boosting entrepreneurship.

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

11. Write two applications of AI used in e-shopping.

12. How do smartphones generate customized recommendations?

13. Pragya is working on an AI project and has completed the first stage of Problem Scoping. In the second stage, she wants to collect all the data sets required for the project. Identify the stage name and different methods to collect data.

14. Differentiate between script bot and smart bot.

15. What are the different steps implemented in bag of words algorithm?

16. In a hospital, an AI-based cancer detector is being used to predict whether or not a patient has cancer. It provides 99.8% accuracy during the evaluation phase. As an AI consultant, you don't want a model to predict that a person has cancer when they don't (the person would end up in a painful and lengthy treatment procedure for an illness they didn't have) and you also don't want a model to predict that a person doesn't have cancer when they have it. What evaluation approaches can be used to assess a model's performance?

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

17. Supriya went shopping to a mall with her sister. Her sister called a cab and the driver navigated the route using Google Maps on his smartphone. After they arrived at the mall, she was amazed to see that the door opened automatically as they approached it. They then went to a store and bought some clothes and walked out without going through the cash counter and afterwards, her sister scanned a QR code and paid for the items purchased. Which technology was employed in everything she had experienced. Is the same technology used everywhere?

18. Rajat is working in an IT company. He wants to upgrade his skills by learning Artificial Intelligence. He searches on Google for an online course, and just after the search, all the apps on his phone, which support advertisements, start sending messages about AI courses offered by various institutions/universities. He is confused and the following questions crop up in his mind. Help him to clear his doubts.

    (a) Why do these apps collect data?   (b) How do they collect data?

    (c) Is there any privacy concern?   (d) What is the name of the feature discussed above?

19. "A neural network is divided into multiple layers and each layer is further divided into several blocks."

    What do you understand by neural network? Explain the different layers of a neural network.

20. Implement bag of words algorithm and create Document Vector Table for the following three documents:

    Document 1: Priya and Ridhi are sisters.

    Document 2: Priya likes coffee and Ridhi likes tea.

    Document 3. Priya likes pizza and Ridhi likes burger.

21. An online electronic company has adopted an AI model that predicts if a newly released smartphone will be popular during the festive season sale. During testing, the AI model made the following predictions.

Confusion Matrix		Reality	
		True	False
Predicted	True	510	40
	False	20	230

    (a) Calculate the accuracy of the model.

    (b) Which metric is important out of precision, recall or F1 score?