DAV PUBLIC SCHOOL, CRRC, MEDICAL ROAD, GAYA JI
SET - 2

Class : XI **Sub : AI** **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):**
   (i) This section has 05 questions.
   (ii) Marks allotted are mentioned against each question/part.
   (iii) There is no negative marking.
   (iv) Do as per the instructions given.
7. **SECTION B – SUBJECTIVE TYPE QUESTIONS (26 MARKS):**
   (i) This section has 16 questions.
   (ii) A candidate has to do 10 questions.
   (iii) Do as per the instructions given.
   (iv) 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 x 4 = 4 marks)**

(i) Pranjali gets up at 5 am and goes to her badminton classes. Then she comes home and finishes her homework before going to school. She does this all by herself. No one tells her to do it. This is an example of—
   (a) Self-motivation
   (b) External motivation
   (c) Both self and external motivation
   (d) Not any specific type of motivation (1)

(ii) Which of the following can cause stress?
   (a) Yoga and Meditation
   (b) Driving during rush hour
   (c) Organized academic life
   (d) Enjoying holidays with family (1)

(iii) What is the term used when you quickly click the left mouse button twice?
   (a) Hover (b) Drag and drop
   (c) Double-clicking (d) Moving (1)

(iv) Ravi learnt that if a laptop gets overheated, the internal parts get damaged. What happens if he leaves his device plugged in even after it is charged 100%?
   (a) It can break. (b) It can stop functioning.
   (c) It can overheat. (d) Data can get corrupted. (1)

(v) Srishti is a young woman who makes earrings. She buys jute from a farmer and makes earrings from that. She sees that most women in her village do not work. So, she hires two women to help her. As her orders increase, she hires three more women to work for her. How was she helping her village grow?
   (a) By selling earrings to women without a job
   (b) By purchasing earrings from the local market
   (c) By buying jute from the local farmer and by providing jobs to local women
   (d) By attracting the women in her village with her creative earrings (1)

(vi) Mary has two people who work for her. Every day, she spends one hour with them to learn about what they've done that day. What is she doing?
   (a) Creating a new product (b) Dividing income
   (c) Managing the business (d) Taking risks (1)

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

(i) ..... and ..... are AI based applications that help us in navigation. (1)

(ii) "This type of intelligence measures one's awareness of the natural world around them and their sensitivities to any changes that occur. It allows us to identify the variation among two different species and understand how they are related".

Identify the type of intelligence described in the above sentence. (1)

(iii) Identify the incorrect statement(s) from the following:

1. Deep learning is a subset of Machine Learning.
2. Machine Learning is a subset of Deep Learning.
3. Artificial Intelligence is a subset of Deep Learning.
4. Deep Learning is the advanced form of AI and ML.

(a) Only (1) (b) (2) and (3)
(c) (1) and (2) (d) Only (3) (1)

(iv) Search engines not only predict what popular searches may apply to your query as you start typing, but it looks at the whole picture and recognizes what you're trying to say rather than the exact search words. This is an example of—

(a) Computer Vision (b) Data Science
(c) Natural Language Processing (d) Natural Language Understanding (1)

(v) When a user installs an app in the smartphone, it asks for access to gallery, contacts, etc. After accepting this, it gives the user agreement which most users accept without realizing the implications. What is the concern here?

(a) Data Privacy (b) Unemployment
(c) AI bias (d) No concern (1)

(vi) We can't make "good" decisions without information. (True/False) (1)

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

(i)..... helps us to summarize all the key points into one single template so that in future, whenever there is a need to look back at the basis of the problem, we can take a look at this and understand the key elements of it. (1)

(ii) Divya was learning neural networks. She understood that there were three layers in a neural network. Help her identify the layer that does processing in the neural network.

(a) Output layer (b) Hidden layer
(c) Input layer (d) Data layer (1)

(iii) Smita is working on a project that involves over a lakh of records. Which of the following should she use to make the best project?

(a) Traditional programming (b) Manual processing
(c) IoT (d) Neural networks (1)

(iv) For better efficiency of an AI project Training data should be ..... .

1. Relevant 2. Scattered
3. Structured 4. Authentic

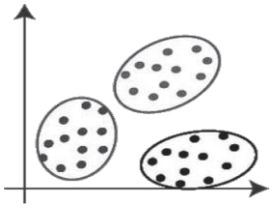
Choose the correct option:

(a) Both (1) and (2) (b) Both (1) and (4)
(c) Only (1) (d) Only (4) (1)

(v) The ..... Sustainable Development Goals (SDGs) were launched at the United Nations Sustainable Development Summit in New York in the year 2015, forming the 2030 Agenda for Sustainable Development.

(a) 17 (b) 15
(c) 13 (d) 19 (1)

(vi)



Identify the algorithm based on the given graph.

(a) Dimensionality reduction (b) Classification

(c) Clustering (d) Regression (1)

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

(i) _____ helps in assigning a predefined category to a document, organize it in such a way that helps customers to find information they want. For example spam filtering in email, auto tagging on social media, categorization of news articles etc. (1)

(ii) Which of the following is the type of data used by NLP applications?

(a) Images (b) Numerical data

(c) Graphical data (d) Text and Speech (1)

(iii) Ayushi was learning about NLP. She wanted to know the term used for the whole textual data from all the documents altogether. Help her in identifying the term used for it. (1)

(iv) What is the full form of TF-IDF? (1)

(v) A corpus contains 12 documents. How many document vectors will be there for that corpus?

(a) 12 (b) 1

(c) 24 (d) 1/12 (1)

(vi) Identify the type of chatbot with the information given below:

These bots work on pre-programmed instructions inside the application/machine and are generally easy to develop. They are deployed in the customer care section of various companies. Their job is to answer some basic queries that they are coded for and connect them to human executives once they are unable to handle the conversation. (1)

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

(i) The output given by the AI machine is known as _____. (Prediction/Reality) (1)

(ii) _____ is used to record the result of comparison between the prediction and reality. It is not an evaluation metric but a record which can help in evaluation. (Accuracy Table/Confusion Matrix) (1)

(iii) Raunak was learning the conditions that make up the confusion matrix. He came across a scenario in which the machine that was supposed to predict an animal was always predicting not an animal. What is this condition called?

(a) False Positive (b) True Positive

(c) False Negative (d) True Negative (1)

(iv) Which two evaluation methods are used to calculate F1-Score?

(a) Precision and Accuracy (b) Precision and Recall

(c) Accuracy and Recall (d) Precision, F1 score (1)

(v) Which of the following statements is not true about overfitting models?

(a) This model learns the pattern and noise in the data to such extent that it harms the performance of the model on the new data set.

(b) Training result is very good and the test result is poor.

(c) It interprets noise as patterns in the data.

(d) The training accuracy and test accuracy both are low. (1)

(vi) Priya was confused with the terms used in the evaluation stage. Suggest her the term used for the percentage of correct predictions out of all the observations.

(a) Accuracy (b) Precision

(c) Recall (d) F1-Score (1)

SECTION B: SUBJECTIVE TYPE QUESTIONS

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

Answer each question in 20–30 words.

6. In SMART goals, what does 'A' stand for? Explain. (2)

7. Sameera is always punctual at school. She has a regular schedule that she follows every day. She plans for study and play time in advance. Enlist the four steps Sameera must have followed for effective time management. (2)

8. Enlist any two methods to protect our data on the computer. (2)

9. What do entrepreneurs do when they run their business? Mention any two points. (2)

10. Raj has a small convenience store in his locality. There are many other convenience stores in the area. Yet, Raj's store survives the competition and does well.

Which stage of an entrepreneur's career process can you relate this to? Explain. (2)

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

11. How do you understand whether a machine/application is AI based or not? Explain with the help of an example. (2)

12. If you do an image search for vacations on a popular search engine, the first few searches mostly return the picture of beaches. What is the concern here? Explain. (2)

13. Suhana works for a company wherein she was assigned the task of developing a project using AI project cycle. She knew that the first stage was scoping the problem. Help her list the remaining stages that she must go through to develop the project. (2)

14. What will be the results of conversion of the term, 'happily' in the process of stemming and lemmatization? Which process takes longer time for execution? (2)

15. What do we get from the "bag of words" algorithm? (2)

16. People of a village are totally dependent on the farmers for their daily food items. Farmers grow new seeds by checking the weather conditions every year. An AI model is being deployed in the village which predicts the chances of heavy rain to alert farmers which helps them in doing the farming at the right time. Which evaluation parameter out of precision, recall and F1 Score is best to evaluate the performance of this AI model? Explain. (2)

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

17. Ashwat is amazed to learn about his sister Ananya who is multi-talented and has excelled in academics, music, dancing, sports and painting. He was quite curious when Ananya told him that he too possessed all these intelligences like every human being does, but only at different levels. He wondered which intelligence she was talking about. Can you help Ashwat in learning about different types of intelligences by naming and explaining any four types of intelligences? (4)

18. Samarth attended a seminar on Artificial Intelligence and has now been asked to write a report on his learnings from the seminar. Being a non-technical person, he understood that the AI enabled machine uses data of different formats in many of the daily based applications but failed to sync it with the right terminologies and express the details. Help Samarth define Artificial Intelligence, list the three domains of AI and the data that is used in these domains. (4)

19. Neural networks are said to be modelled the way how neurons in the human brain behave. A similar system is mimicked by the AI machine to perform certain tasks. Explain how neural networks work in an AI model and mention any three features of Neural Networks. (4)

20. Samiksha, a student of class X, was exploring the Natural Language Processing domain. She got stuck while performing the text normalization. Help her to normalize the text on the segmented sentences given below:

Document 1: Akash and Ajay are best friends.

Document 2: Akash likes to play football but Ajay prefers to play online games. (4)

21. Automated trade industry has developed an AI model which predicts the selling and purchasing of automobiles. During testing, the AI model came up with the following predictions.

Confusion Matrix		**Reality**	
		Yes	**No**
Predicted	**Yes**	60	25
	No	05	10

(i) How many total tests have been performed in the above scenario?

(ii) Calculate precision, recall and F1 Score. (4)