ARTIFICIAL INTELLIGENCE (417)
Class X (Session 2022-23)

Time Allowed: 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):**
    i. This section has 05 questions.
    ii. There is no negative marking.
    iii. Do as per the instructions given.
    iv. Marks allotted are mentioned against each question/part.
7. **SECTION B – SUBJECTIVE TYPE QUESTIONS (26 MARKS):**
    i. This section contains 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

Q.1	Answer any 4 out of the given 6 questions on Employability Skills (1 x 4 = 4 marks)	
i.	What is not a symptom of stress? a) Increased sweating b) Cold hands or feet c) Dry mouth d) None of these	1
ii.	The ability to control one's emotions, thoughts and behaviour effectively in different situations is called _____ . a) Time management b) Emotional Intelligence c) Behaviour Management d) Self Management	1

iii.	Which of these is not a business activity? a) Service b) Manufacturing c) Creativity d) Merchandising	1
iv.	Given below are two statements **Statement I:** Cache memory is faster than random access memory **Statement II:** Random access memory is closer to the processor than cache memory In light of the above statements, choose the most appropriate answer from the options given below: a) Both Statement I and Statement II are correct b) Both Statement I and Statement II are incorrect c) Statement I is correct but Statement II is incorrect d) Statement I is incorrect but Statement II is correct	1
v.	Nitesh buys raw material for his business from Himachal Pradesh. He learns that same material is cheaper in Haryana. So, he decides to start buying material from there. Select the correct business activity. a) Makes decisions b) Divides income c) Takes risk d) Makes new product	1
vi.	Nimisha a young enthusiastic girl sells pasta and pizza in her locality in the evenings. Everyone like her food and she earns good money for a comfortable living. What type of business she runs? a) Wage employed b) Partnership c) Sole proprietorship d) None of these	1
Q.2	**Answer any 5 out of the given 6 questions (1 x 5 = 5 marks)**	
i.	Under which stage of AI Project Cycle, we look at various parameters which affect the problem we wish to solve so that the picture becomes clearer? a) Modelling b) Evaluation c) Problem Scoping d) Data Exploration	1

ii.	What is the main challenge/s of NLP?
	   a) Handling Tokenization
	   b) Handling Ambiguity of Sentences
	   c) Handling POS-Tagging
	   d) All of the mentioned
		1

iii.	What's the main point of difference between human & machine intelligence?
	   a) human perceive everything as a pattern while machine perceive it merely as data
	   b) human have emotions
	   c) human have more IQ & intellect
	   d) human have sense organs
		1

iv.	When a project is started, the person should be very clear with _____ .
	   a) Problem Reasons
	   b) Problem Solutions
	   c) Problem Statement
	   d) All of these
		1

v.	F1 score is 1 when _____ .
	   a) Recall is 100%
	   b) Recall and Precision is 100%
	   c) Precision is beyond expectation
	   d) Recall and Precision in 0
		1

vi.	Sometimes, you use the internet and try to acquire data for your project from some random websites. Such data might not be authentic as its accuracy cannot be proved. Due to this, it becomes necessary to find a _____.
	   a) Reliable source
	   b) Random source
	   c) Unauthorized source
	   d) All of the above
		1

Q.3	Answer any 5 out of the given 6 questions (1 x 5 = 5 marks)	
i.	Which of the following is incorrect? i. Testing data is the one on which we train and fit our model basically to fit the parameters ii. Training data is used only to assess performance of model iii. Testing data is the unseen data for which predictions have to be made a) i) and iii) only b) ii) and iii) only c) i) and ii) only d) i), ii) and iii)	1
ii.	The core idea to develop AI is building machines and algorithms to _____ . a) functions like anything b) perform computation tasks and functions like human brain c) perform only arithmetic tasks d) perform logical comparisons only	1
iii.	Vinita is working on a model where rules for every task is already mentioned by the developer. Which type of model it is? a) learning based b) rule-based c) developer based d) programmer based	1
iv.	Which of the following is one of the government open source for collecting data? a) www.ayushmanbharat.org b) www.india.gov.in c) www.bharatdata.in d) www.merabharatmahan.com	1
v.	Which of the following AI domain collects data, maintain the datasets and derives the meaning out of it? a) Data Science b) Computer Vision c) Natural Language Processing d) Neural Network	1

vi.	**Statement A:** Classification deals with discrete data
	Statement B: Regression deals with continuous data
	    a) Statement A is correct
	    b) Statement B is correct
	    c) Statement A and B both are correct
	    a) Statement A and B both are incorrect
		1

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

i.	How the spam messages are detected in email filters?
	    a) By uncovering certain words
	    b) By copying the message directly
	    c) By sender's information
	    d) By the content of the email
		1

ii.	Which of the following data helps in forming an accurate of actions over time?
	    a) structured data
	    b) unstructured data
	    c) semi-structured
	    d) time-stamped
		1

iii.	The goal of _____ is to identify sentiment among several posts.
	    a) Sentiment Analysis
	    b) Automatic Summarization
	    c) Text classification
	    d) Virtual Assistants is to identify sentiment among
		1

iv.	Which of the following components is the core of every AI system?
	    a) Information
	    b) Training
	    c) Testing
	    d) Data
		1

v.	_____ is considered to be one of the best methods to address stress as it is easy to implement on people and also gives good results.
	    a) Common Behavioural Therapy (CBT)
	    b) Cognitive Behavioural Therapy (CBT)
	    c) Connection Behavioural Therapy (CBT)
	    d) None of the above
		1

vi.	Steps to implement bag of words algorithm is given below. Choose the correct sequence.
	 1. Text Normalisation
	 2. Create document vectors
	 3. Create document vectors for all the documents
	 4. Create Dictionary
	
	   a. 1, 2, 3, 4
	   b. 1, 4, 3, 2
	   c. 2, 3, 1, 4
	   d. 1, 4, 2, 3
		1

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

i.	The _____ allows us to understand the prediction results.
	   a) Overfitting
	   b) Problem Scoping
	   c) Confusion Matrix
	   d) Data acquisition
		1

ii.	If model will simply remember the whole training set, and will therefore always predict the correct label for any point in the training set. This is known as _____ .
	   a) Overfitting
	   b) Overriding
	   c) Over remembering
	   d) None of the above
		1

iii.	_____ identify each document in the corpus, find out how many times the word from the unique list of words has occurred.
	   a) Text Normalization
	   b) Create Dictionary
	   c) Document Vectors
	   d) All of the above
		1

iv.	Recall-Evaluation method is _____ .
	   a) defined as the percentage of true positive cases versus all the cases where the prediction is true
	   b) defined as the percentage of correct predictions out of all the observations
	   c) defined as the fraction of positive cases that are correctly identified
	   d) comparison between the prediction and reality
		1

v.	What will be the outcome, if the Prediction is "Yes" and it matches with the Reality? What will be the outcome, if the Prediction is "Yes" and it does not match the Reality? a) True Positive, True Negative b) True Positive, False Positive c) True Negative, False Negative d) True Negative, False Positive	1
vi.	_____helps in removing the unnecessary words out of a text body. a) Document Classification b) Topic Modelling c) Information Retrieval System d) Stop word filtering	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.**		
Q.6	Identify the given situation with steps of process of Entrepreneurship. 1. Laaksh opens 5 painting stores across India. 2. There are many coaching classes in Mumbai. Jacob owns one of them. He is starting morning batches to attract more students to his classes. 3. Salma has started her clothing line on the Internet.	2
Q.7	What is the difference between a misconception and reality? Give an example.	2
Q.8	What is time management and how can you manage your time?	2
Q.9	How will you prevent others from using your computer?	2
Q.10	Write any four advantages of self-regulation.	2

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

Q.11	<u>Case Study</u> In a reputed school "Bhartiya Shiksha", only those students who have more than 75% of the attendance are eligible to take the annual exam. Rakesh, who is teaching in "Bhartiya Shiksha" school, is facing following issues while taking the attendance: 1. Rakesh wants to monitor the students who are attending the classes regularly and who are not? 2. The traditional way of taking attendance is very time-consuming. 3. Regular monitoring whether somebody is giving proxy attendance is very difficult. Based on the given Case Study prepare a 4W Problem Statement Template.	2
Q.12	What is a confusion matrix? Explain in detail with the help of an example.	2
Q.13	Explain with an example of a circumstance where a false positive would come at a high cost.	2
Q.14	Losing a Customer is one of the toughest challenges for every organization. Acquiring a new client is more expensive than retaining an existing customer. The customer attrition directly affects the company's operating costs and market spending. This happens if a consumer is no longer a paid customer of a certain company. Using an AI application, it is possible to identify a customer's feelings with data sets such as phone records, web chats and feedback on social media platforms. Explain how is it possible and using which domain?	2
Q.15	Justify the sentence – "For any AI project to be efficient, the training data should be authentic and relevant to the problem statement scoped."	2
Q.16	How does the relationship between a word's value and frequency in a corpus look like in a given graph?	2

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

Q.17	Rehan has built a bot which does everything what is programmed into it. What kind of bot is it: Script bot or Smart bot? Support your answer by differentiating between both.	4
Q.18	Which evaluation metric would be crucial in the following cases? Justify your answer. a. Mail Spamming b. Gold Mining c. Viral Outbreak	4
Q.19	Following is the corpus: **Document 1:** This is my first experience of Text Mining. **Document 2:** I have learnt new techniques in this. Perform the following functions on the above corpus: a. Sentence Segmentation b. Tokenization c. Stop words removal d. Lowercase conversion	4
Q.20	Calculate Accuracy, Precision, Recall and F1 Score for the following Confusion Matrix on Heart Attack Risk. Also suggest which metric would not be a good evaluation parameter here and why?	4

The Confusion Matrix	Reality: 1	Reality: 0
Prediction: 1	50	20
Prediction: 0	10	20

| Q.21 | Your younger sibling has spend a lot of time in preparing a 3D model of India Gate which is 3 ft tall and kept it on ground for safety concerns. Your mother started the autonomous robot to clean the floor and it tries to clean the area near the model but it falls and break.
1. Who can be held liable for damages caused by autonomous systems?
2. List two AI Ethics. | 4 |