केंद्रीय विद्यालय संगठन , बेंगलुरु संभाग

KENDRIYA VIDYALAYA SANGATHAN ,BENGALURU REGION

FIRST PRE-BOARD EXAMINATION 2024-25

MARKING SCHEME

प्रथम प्री बोर्ड परीक्षा -2024-25

CLASS: X   **SUBJECT: ARTIFICIAL INTELLIGENCE**

MAX MARKS: 50   **TIME ALLOWED:** 2HRS

Section A (Objective Type Questions)
1	**Answer any 4 out of the given 6 question on Employability skill(1X4=4 Marks)**
i	Statement 1: A realistic goal is one that cannot be achieved with in limited time. Statement 2: Breaking down big goal in to smaller parts helps in achieving the goal. a) Both statements 1 and statement 2 are correct. b) Both statements 1 and statement 2 are incorrect. c) Statement 1 is correct but statement 2 is incorrect. d)Statement 1 is incorrect but statement 2 is correct. Ans (d) Statement 1 is incorrect but statement 2 is correct.
ii	Which of these is NOT a common communication barrier? (a) Linguistic barrier (b) Interpersonal barrier (c) Financial barrier (d) Organisational barrier Ans: (c) Financial barrier
iii	The first screen that appears on monitor after loading OS is called _____ (a) Icons (b) Desktop (c) Wall paper (d) None of the above Answer: (b) Desktop
iv	When you are under _____ for a prolonged period of time, it can cause health problems and mental troubles as well. a. Stress b. Discipline c. Timeliness d. Goal – Setting Ans: a. Stress

v.	Qualities of entrepreneur are:
	     a) Never giving up b) Hard working
	     c)Perseverance d) All the above
	 Ans (d) All the above

vi.	Which organisation has made the Sustainable Development Goals. (a) United Nations (b) League of Nations (c) UNICEF (d) World Health Organisation Ans: (a) United Nations
2	**Answer any 5 out of 6 the given question (1X5=5 marks)**
i.	Companies use _____ application of NLP , to identify opinions and feelings/emotions online to help them understand what customers think about their products and services. a. Sentiment Analysis b. Automatic Summarization c. Text classification d. Virtual Assistants Ans: a. Sentiment Analysis
ii	A Category of intelligence relating to the ability to process information on the environment around us is _____ a. Musical Intelligence b. Naturalist Intelligence

	c. Interpersonal Intelligence d. Kinaesthetic Intelligence Ans. b. Naturalist Intelligence
iii	Fill in the blank: Neural Network is a mesh of multiple _____. Answer: Hidden Layers / Layers

iv	Identify the application of Computer Vision from the following:
	    a) Voice Assistant b) Face recognition
	    c) Recommendations d) None of the above
	Ans b) Face recognition

v.	Which of the following is a common data source used in data science? a) Social Media Posts b) Weather Reports c) Sensor Data d) All of the Above Answer: d) All of the Above

Vi	Identify the domain of AI in the following image:
	                         a) Data Science b) Natural Language Processing
	                         c) Computer Vision d) Rule Base
	
	Answer :Computer Vision

3	**Answer any 5 out of 6 the given question (1X5=5 marks)**
i.	Which of the following is an example of a voice based virtual assistant? a. Alexa b. Siri c. Cortana d. All of the above Ans: d. All of the above
ii.	_____ is defined as the ability to perceive the visual world and the relationship of one object with other. a. Mathematical Logical Reasoning b. Musical Intelligence c. Spatial Visual Intelligence d. Linguistic Intelligence Ans. c. Spatial Visual Intelligence
Iii	Which of the following tasks is typically associated with computer vision? a) Predicting stock prices b) Translating text from one language to another c) Identifying faces in images d) Classifying emails as spam or not spam Answer: c) Identifying faces in images
Iv	What does 'overfitting' refer to in the context of machine learning models? a) A model that performs well on both training and testing data b) A model that is too simple to capture the underlying patterns in the data c) A model that performs exceptionally well on training data but poorly on testing data d) A model that has been successfully deployed in a production environment Answer: c) A model that performs exceptionally well on training data but poorly on testing data
v.	In the context of computer vision, what does "object detection" involve? a) Analyzing and converting text data into numerical data b) Identifying and locating objects within an image c) Sorting emails based on their content d) Predicting weather conditions based on historical data Answer: b) Identifying and locating objects within an image
Vi	It is defined as the fraction of positive cases that are correctly Identified: i.F1 Score ii. Precision iii. Accuracy iv. Recall Answer: Recall
4	**Answer any 5 out of the given 6 question (1X6=6 marks)**

i.	_____ work around a script which is programmed in them. a. Script bots b. Smart bots c. Both of the above d. None of the above Ans: a. Script bots
Ii	**Assertion (A):** The confusion matrix provides a summary of prediction results on a classification problem. **Reason (R):** The confusion matrix includes values for true positives, true negatives, false positives, and false negatives, which help in evaluating the performance of a classification model. a.Both Assertion and Reason are correct, and Reason is the correct explanation for Assertion. b.Both Assertion and Reason are correct, but Reason is not the correct explanation for Assertion. c.Assertion is correct, but Reason is incorrect. d.Assertion is incorrect, but Reason is correct. Answer :a. Both Assertion and Reason are correct, and Reason is the correct explanation for Assertion.
iii	When a machine possesses the ability to mimic human traits, i.e., make decisions, predict the future, learn and improve on its own, it is said to have _____. a. Artificial Intelligence b. Natural Intelligence c. Machine Understanding d. Machine Intelligence Ans. a. Artificial Intelligence
iv	Which of the following is not an authentic source for data acquisition? a. Sensors b. Surveys c. Web Scraping d. System Hacking Answer: System Hacking
v.	_____ is defined as the percentage of correct predictions out of all the observations. i.F1 Score ii. Precision iii. Accuracy iv. Recall Answer:Accuracy
Vi	Statement 1: Email filter is an application of Data Science. Statement 2: Recommendation of products on shopping websites is also an application of Data science. a) Both statements 1 and statement 2 are correct. b) Both statements 1 and statement 2 are incorrect. c) Statement 1 is correct but statement 2 is incorrect. d)Statement 1 is incorrect but statement 2 is correct. Answer a) Both statements 1 and statement 2 are correct.
5	**Answer any 5 out of the given6 question (1X6=6 marks)**

i.	The possible difficulties a machine would face in processing natural language is _____
	  a. Arrangement of the words and meaning
	b. Multiple Meanings of a word
	  c. Perfect Syntax, no Meaning
	d. All of the above
	Ans: d. All of the above

ii.	Which is an AI based chatbot? a) Script bot b) Smart bot c) Both d)None Answer: b)Smartbot
iii.	Smita makes a machine which is designed to learn by itself using the provided data and make accurate Predictions/ Decisions, Which of the following enables the machines for making Predictions/ Decisions?

	a. Artificial Intelligence b. Deep Learning c. Machine Learning d. None of the above Ans. c. Machine Learning
iv	**In this 4W canvas block, which W, focus on the context/situation/location of the problem.** **Answer:Where**
v	A company is analysing customer reviews to understand the overall sentiment (positive, negative, or neutral) towards their product. They use a tool to process the text data and categorize it into these three sentiment labels. What aspect of data science is the company primarily using in this scenario? a) Data Visualization b) Data Cleaning c) Data Analysis d) Data Preprocessing Answer c) Data Analysis
vi	**Which one of the following scenarios would result in a high false positive cost?** a. A model that correctly identifies emails as spam when they are actually spam, in a scenario where spam filtering is highly accurate. b. A model that correctly identifies a customer as likely to purchase a product, in a scenario where the product is frequently bought. c. A model that incorrectly identifies a patient as having a disease when they do not actually have it, in a scenario where the disease is rare but treatment is expensive d. A model that fails to detect fraudulent transactions but correctly identifies legitimate transactions, in a scenario with many transactions but few fraud cases. Answer c. A model that incorrectly identifies a patient as having a disease when they do not actually have it, in a scenario where the disease is rare but treatment is expensive
	SECTION- B **Descriptive type Questions** **Write in 20-30 words each**
	Answer any 3 out of 5 given questions on employability skill.(2X3=6 marks)
6	The symbol shown represents 'School Ahead ',which type of communication uses such symbols and write any 2 advantages of using that type of communication. Visual Communication · 1 mark . **Suitable for Illiterate Receivers**, Encourages Communication Skills,Simple Explanation 1 mark for any 2 advantages
7	'Security break is leakage of information stored in a computer'. Write any two ways in which a security break can happen Answer(1 mark for each one with little explanation) **Phishing Attacks:** Trick users into revealing sensitive information. **Malware:** Malicious software designed to exploit systems. **DoS/DDoS Attacks:** Overwhelming systems to make them unavailable. **Insider Threats:** Abuse of access by trusted individuals. **Credential Stuffing:** Using stolen credentials to access other accounts.
8	Imagine you are a high school student working on a group project for your AI class. The project involves designing an AI-based solution for a local community issue. You are responsible for coordinating tasks, meeting deadlines, and ensuring that everyone in the group contributes effectively. Identify two self-management skills that are essential for successfully completing this group project and explain how each skill can be applied in this scenario. Answer: **Time Management, Organization, Self-Motivation any 2 :1 mark, 1 mark for applying in the scenario.**
9	In the world where customer requirements are constantly changing, which quality an entrepreneur should have to succeed? Discuss. Ans. Innovative. 1 mark

	Customer's requirements and tastes keep on changing, therefore, production should meet the customer's requirements. Thus, innovativeness is important characteristic of an entrepreneur. He always tries to out strive others by taking initiative in doing new things, i.e. exploring new products, new markets, new raw materials, new methods of production etc. 1 mark for explanation
10	List two ways in which we can use resources sensibly and become responsible for our own environment Ans: 1. reusing paper, glass, plastic, water, etc. 2. taking cloth bags to market carrying fruits and vegetables. 3. donate things we do not use such as clothes, books, furniture, food, or any other relevant way one mark one suitable way
	Answer any 4 out of 6 given questions in 20-30 words each.(2X4=8 marks)
11	"A firefighter has to get to a burning building as quickly as he can. There are three paths that he can take. He can take his fire engine over a large hill (5 miles) at 8 miles per hour. He can take his fire engine through a windy road (7 miles) at 9 miles per hour. Or he can drive his fire engine along a dirt road which is 8 miles at 12 miles per hour'' Which words in the above corpus have the highest values and the ones which have the least frequency what are the called? Answer: Stop words like - a, to, at, the, etc. have highest values in a corpus. 1 mark Words occur the least are called Rare or valuable words. 1 mark
12	a) When anyone searches about Surgeon on the internet, the picture of a Male appears. Why it happens. b) What should be done to avoid it Answer: Ai or gender Bias , 1 mark Addressing this issue involves diversifying training data, adjusting algorithms, promoting inclusive content, raising user awareness, and conducting regular audits. These actions help to create a more balanced and representative digital environment. Any two point to avoid give 1 mark
13	Neeta has been working on an AI Project. She has completed the problem scoping, but she has forgotten the next stage. help her by listing all the remaining steps in the sequence and explain the objectives of these steps. The remaining steps of AI project cycle are as given: • data acquisition by collecting data from various reliable and authentic sources. • data Exploration or validation: ensures data quality and accuracy also give it a visual image of different types of representations like graphs, databases, flow charts, maps, etc. •Modelling: transforms raw data into a structured format •Evaluation test the selected models and figure out which is the most efficient one. • The most efficient model is now the base of your AI project and you can develop your algorithm around it after evaluation, the project cycle is now complete and what you get is your AI project., ½ for each step in correct sequence and brief given.
14	Explain the term aspect ratio. How it is expressed. Answer: An aspect ratio is the width-to-height ratio of an image.1 mark It is typically expressed as two numbers separated by a colon, such as 7:4 or 4:3. A square image has equal width and height, described as a 1:1 aspect ratio.1 mark for expression
15	Data Sciences majorly work around analysing the data and when it comes to AI, the analysis helps in making the machine intelligent enough to perform tasks by itself. There exist various applications of Data Science in today's world. Give any 2 examples of data sciences in our day to day life with brief information Answer: Genetics & Genomics, Fraud and Risk Detection, Internet Search, Targeted Advertising or any other relevant example half mark for example and half mark for explanation.
16	Draw the confusion matrix for the following data • the number of true positive = 50 • the number of true negative =78 • the number of false positive = 43

	• the number of false negative = 48

Answer:

The Confusion Matrix	Reality: Yes	Reality: No
Prediction: Yes	50	43
Prediction: No	48	78

(½ marks each for mapping the values in the correct section, ½ *4=2 marks)

Answer any 3 out of 5 given questions in 50-80 words each.(4X3=12 marks)

17	Sumit is amused , when his friend explains him how AI technologies can be integrated with non-AI technologies. Help him understand this integration with 2 examples.

Answer:

AI in Smart Home Systems

Non-AI Technology: Home Automation Systems

AI in Healthcare with Medical Devices

Non-AI Technology: Medical Diagnostic Equipment (e.g., X-ray machines, MRI scanners)

- In smart home systems, AI enhances non-AI technologies by making them adaptive and intelligent.
- In medical diagnostic equipment, AI improves the analysis of images, aiding doctors in making accurate diagnoses.

Integrating AI with non-AI technologies leverages the strengths of both to create more advanced and efficient solutions.

1 marks for each integration and1 mark for each explanation

18	Identify the type of learning based approach in the figure and also explain various learning approaches.
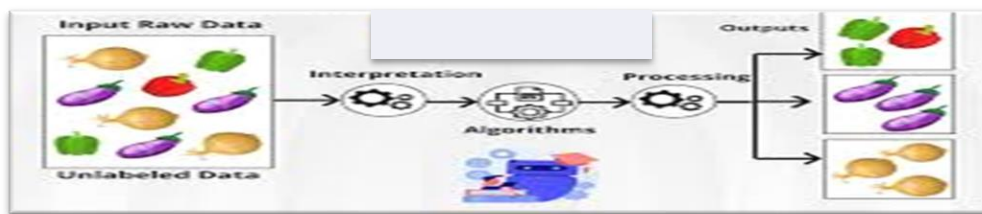
Answer :Unsupervised learning 1 mark, explaination of all three supervised, unsupervised and reinforcenment learning 1 /2 mark for writing name 1 /2 mark for explaination

19	Differentiate between rule-based and learning-based AI modelling approaches.

Answer:

Rule Based Approach: It refers to the AI modelling where the relationship or patterns in data are defined by the developer. The machine follows the rules or instructions mentioned by the developer, and perform its task accordingly.

 Learning Based Approach: In this approach, the machine learns by itself. It refers to the AI modelling where the relationship or patterns in data are not defined by the developer. In this approach, random data is fed to the machine and it is left on the machine to figure out patterns and trends out of it. Generally, this approach is followed when the data is un labelled and too random for a human to make sense out of it.

2 marks each

20	Consider the following text data and perform a step by step process for text normalization Provide the normalized version of the text:

"The quick, brown fox jumps over the lazy dog. THE QUICK, BROWN FOX JUMPS OVER THE LAZY DOG!!!"

Answer: Raw Text: "The quick, brown fox jumps over the lazy dog. THE QUICK, BROWN FOX JUMPS OVER THE LAZY DOG!!!"

Steps for Normalization:
1. Convert to Lowercase:

"the quick, brown fox jumps over the lazy dog. the quick, brown fox jumps over the lazy dog!!!"

    2. Remove Punctuation:

"the quick brown fox jumps over the lazy dog the quick brown fox jumps over the lazy dog"

    3. Remove Extra Spaces:(There are no extra spaces to remove in this case.)

Normalized Text:

"the quick brown fox jumps over the lazy dog the quick brown fox jumps over the lazy dog"

21	An AI model made for the prediction of Water Shortage in Schools in a state

(Water Shortage in School)

The Confusion Matrix	Reality: 1	Reality: 0
Prediction: 1	75	5
Prediction: 0	5	15

    i. Calculate Precision, Recall and F1 Score

    ii.Identify the total number of predictions made by the model correctly.

Answer

i. Calculation: Precision=TP/(TP+FP) =75 / (75+5) = 75 /80 = 0.9375

                Recall=TP/(TP+FN)   = 75 / (75+5) = 75 /80 = 0.9375

                F1 Score = 2*Precision*Recall/(Precision+ Recall)

                        = 2 * ((0.9375 *0.9375) / (0.9375+0.9375)

                        = 2 * (0.8789 / 1.875) = 2 * 0.46875 = 0.9375

             Precision=0.9375% Recall=0.9375% F1 Score=0.9

ii. the total number of predictions made by the model correctly:(TP+TN)=75+15=90

note:(½ mark for each formula and ½ mark each for substitution of values in part(i))

Please note: the mathematical calculations can be ignored and 1 marks for part (ii)