

20/12/25
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PREBOARD II
CLASS X
ARTIFICIAL INTELLIGENCE (SUB CODE:417)

Max. Time : 2hrs

Max. Marks : 50

General Instructions:

1. Please read the instructions carefully.
2. This question paper consists of 21 questions in two sections: Section A and Section B
3. Section A has Objective type questions Section B contains Subjective type questions.
4. Out of given $(5 + 16 =) 21$ questions of $(5 + 10 =) 15$ questions in the allotted (maximum) time of 2 hours
5. All questions of a particular section must be attempted in correct order.

Section A - Objective type questions (24 marks)

- This section has 5 question
- Mark allotted are mentioned against each question /part
- There is no negative marking
- Do as per the instructions given

Section B - Subjective type questions (26 marks):

- This section has 16 question
- A candidate has to do 10 questions
- Do as per the instructions given.
- Marks allotted are Mention against each question/ part

SECTION A: OBJECTIVE TYPE QUESTIONS

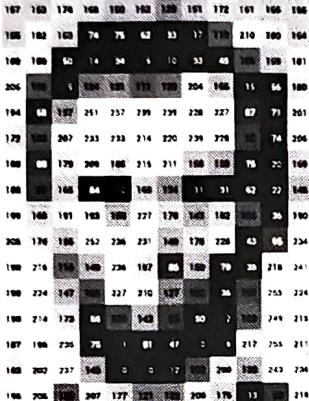
Q1	Answer any 4 out of the given 6 questions on Employability skills($1 \times 4 = 4$)	Marks
i	<p>A student nods after understanding the teacher's explanation. In the communication cycle, this is an example of:</p> <p>a) Encoding b) Sender c) Feedback d) Decoding</p>	1
ii	<p>Rohan wakes up early to practice football because he genuinely enjoys playing. What type of motivation is this?</p> <p>a) External b) Internal c) Peer-driven d) Fear-based</p>	1

iii	<p>How can an antivirus protect your device?</p> <p>a) It can protect it from overheating b) It can increase its performance c) It can prevent data from getting corrupt d) It can backup data</p>	1
iv	<p>Meera starts a handmade soap business. In the beginning, sales were very low. Instead of giving up, she keeps improving her packaging, talks to customers for feedback, and slowly builds a steady customer base over six months.</p> <p>Which entrepreneurial quality is Meera demonstrating?</p> <p>a) Creativity b) Impulsiveness c) Patience d) Aggression</p>	1
v	<p>A shopkeeper starts giving paper bags instead of plastic bags after realizing the harmful effects of plastic on marine life. What does this action represent?</p> <p>a) Increasing production b) Sustainable practice c) Promoting fossil fuels d) Reducing business cost</p>	1
vi	<p>Assertion (A): Self-awareness helps students understand their strengths and weaknesses.</p> <p>Reason (R): Knowing personal strengths helps in choosing suitable tasks and goals.</p> <p>a) Both A and R are true, and R is the correct explanation of A b) Both A and R are true, but R is NOT the correct explanation of A c) A is true but R is false d) A is false but R is true</p>	1
Q2.	Answer any 5 out of given 6 questions:	
i	<p>The main purpose of using ethical frameworks in decision-making is to:</p> <p>a) Make decisions faster without any evaluation b) Ensure decisions match values and benefit all stakeholders c) Focus only on profit-making d) Avoid responsibility for outcomes</p>	1
ii	<p>How is resolution typically expressed?</p> <p>a) By the number of pixels along the width and height, such as 1280x1024 b) By the brightness level of each pixel, ranging from 0 to 255 c) By the total number of pixels, such as 5 megapixels d) By the arrangement of pixels in a 2-dimensional grid</p>	1
iii	<p>A company wants to analyze customer opinions on social media and improve</p>	1

	<p>its services by automatically identifying the most important words and expressions from posts. Which NLP tool would be most useful for this task?</p> <ol style="list-style-type: none"> Sentiment Analysis Keyword Extraction Text Translation Speech Recognition 	
iv	<p>After training a machine learning model, a company tests it on new data to check its accuracy and performance before using it in a real application. Which stage of the AI project cycle is being described?</p> <ol style="list-style-type: none"> Data Collection Model Training Evaluation Model Deployment 	1
v	<p>Assertion (A): Using the same dataset for training and testing a model can lead to overfitting and inaccurate evaluation. Reason (R): Splitting the dataset into separate training and testing sets helps check how well the model performs on unseen data.</p> <ol style="list-style-type: none"> Both A and R are true, and R is the correct explanation of A Both A and R are true, but R is not the correct explanation of A A is true, but R is false A is false, but R is true 	1
vi	<p>A real estate company wants to predict house prices based on features like area, number of rooms, and location. Which type of ML technique is most suitable for this task?</p> <ol style="list-style-type: none"> Classification Clustering Regression Reinforcement Learning 	1
Q3.	Answer any 5 out of given 6 questions	
i	<p>All the colors displayed on a digital screen can be created by combining different _____ of red, green, and blue.</p> <ol style="list-style-type: none"> Shades Intensities Patterns Textures 	1
ii	<p>A school uses an AI system to identify students at risk of failing exams. Sometimes the AI fails to flag students who are actually struggling (False Negatives). Which metric should the school focus on improving to reduce False Negatives and ensure at-risk students get help?</p> <ol style="list-style-type: none"> Precision Accuracy 	1

	c) Recall d) F1-Score	
iii	The image represents the application of a) NLP b) Data Science c) Computer Vision d) Machine Translation	
iv	An e-commerce company wants to group customers who show similar buying patterns so that it can provide personalized product recommendations. Which type of AI technique is most suitable for this task? a) Classification b) Regression c) Clustering d) Reinforcement Learning	1
v	Which NLP application would use the referred picture as input? a) Sentiment Analysis b) Text Classification c) Text Summarization d) Speech Recognition	
vi	A weather forecasting system predicts the temperature to be 28°C, but the actual temperature is 31°C. What is the absolute error in prediction? a) 2°C b) 3°C c) 4°C d) 5°C	1
Q4.	Answer any 5 out of given 6 questions	
i	Assertion (A): Value-based ethical frameworks only focus on protecting human rights and do not consider the overall benefits or harm of actions. Reason (R): Utility-based frameworks evaluate actions based on maximizing overall good and minimizing harm, considering benefits and risks for society. a) Both A and R are true, and R is the correct explanation of A b) Both A and R are true, but R is not the correct explanation of A c) A is true, but R is false d) A is false, but R is true	1
ii	With a perceptron model, a smart home system predicts whether to turn on the heater based on the following factors:	1

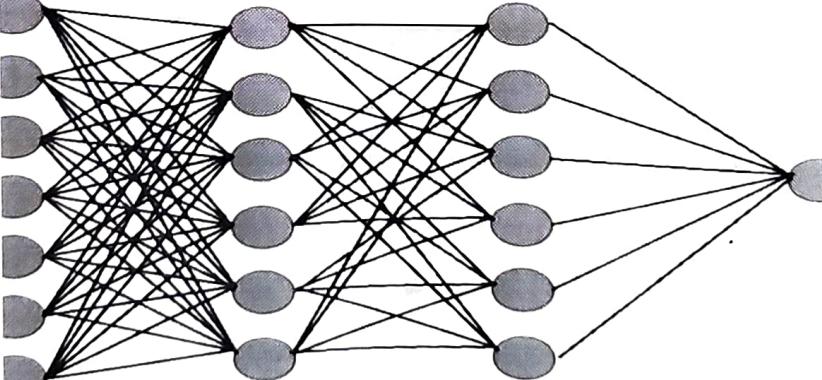
	<p>x_1 = Room temperature (0 -cold, 1 - warm) x_2 = Time of day (0 -day, 1 -night) x_3 = Occupancy (0- empty, 1 -someone present)</p> <p>Where,</p> $y = w_1x_1 + w_2x_2 + w_3x_3 + b$ <p>If $w_1 = 0.4$, $w_2 = 0.3$, $w_3 = 0.5$, $b = 0.1$, and during day time when temperature is warm and no one is in the room, then $y = ?$</p> <p>a) 0.4 b) 0.5 c) 0.6 d) 0.7</p>	
iii	<p>A high F1 score generally suggests:</p> <p>a) A significant imbalance between precision and recall b) A good balance between precision and recall c) A model that only performs well on specific data points d) The need for more training data</p>	1
iv	<p>Statement 1: A False Positive occurs when the model predicts negative, but the actual class is positive. Statement 2: A True Negative occurs when the model correctly predicts a negative class.</p> <p>a) Both statements are true b) Both statements are false c) Statement 1 is false, but Statement 2 is true d) Statement 1 is true, but Statement 2 is false</p>	1
v	<p>A news company is cleaning large amounts of text data before using it to train an AI model. Their team removes punctuation, breaks sentences into words, and converts words to their base form. Which of the following actions is NOT part of this text-normalisation process?</p> <p>a) Tokenization b) Lemmatization c) Punctuation removal d) Document summarization.</p>	1
vi	<p>A factory wants to automatically check products on the assembly line for scratches, dents, or other defects using cameras. Which AI technology can be applied here?</p> <p>a) Speech Recognition b) Natural Language Processing (NLP) c) Computer Vision d) Reinforcement Learning</p>	1
Q5.	Answer any 5 out of given 6 questions	
i	Which of the following statements is NOT true about supervised learning?	1

	<p>a) Requires labeled data for training. b) Used for classification and regression tasks. c) Can be less efficient for large datasets. d) Often used in image recognition applications.</p>	
ii	 <p>What does the pixel value represent in an image? a) Width of the pixel b) Brightness of the pixel c) Height of the pixel d) Resolution of the pixel</p>	1
iii	<p>A mobile AI app tries to identify whether a plant leaf is healthy or infected. Out of 40 leaves tested, the AI app correctly identifies 32 leaves. What is the accuracy of the AI app?</p> <p>a) 60% b) 75% c) 80% d) 90%</p>	1
iv	<p>In text processing, what are stop words?</p> <p>a) Words with the frequent occurrence in the corpus b) Words with negligible value that are often removed during preprocessing c) Words with the lowest occurrence in the corpus d) Words with the most value added to the corpus</p>	1
v	<p>State True or False: Bag of Words model always considers the order of words in a sentence.</p>	1
vi	<p>Which of the following is true about Accuracy as an evaluation metric?</p> <p>a) It works best only when both classes have nearly equal numbers of samples. b) It focuses only on correctly predicted positive cases c) It ignores incorrect predictions completely d) It always gives reliable results even in imbalanced datasets</p>	1
<p>Answer any 3 out of the given 5 questions on Employability Skills. Answer each question in 20-30 words. $3 \times 2 = 6$</p>		
Q.6	<p>a) What are the factors that influence the selection of communication</p>	2

	Methods? b) Give an example of a situation where urgency/priority might change the communication method you choose.	
Q.7	Ananya is a student who has multiple assignments, revision for exams, and household responsibilities. She often feels overwhelmed, misses deadlines, and ends up studying at the last minute. As a student aware of Time Management, suggest effective steps to manage her time efficiently.	2
Q.8	Write some simple ways to keep the computer devices clean and safe.	2
Q.9	Brief the career process involved in becoming a successful entrepreneur with an example.	2
Q.10	Discuss the problem related to sustainable development and ways to overcome it.	2

Answer any 4 out of the given 6 questions in 20-30 words each. $4 \times 2 = 8$

Q.11	Name any 2 domains of AI with one application each.	2
Q.12	<p>Relax! I'm just pulling your leg</p> <p>Means he is just joking</p> <p>Does not mean he's pulling his actual leg</p>	
Which stage of the NLP is represented here. Write about it.		
Q.13	How does computer vision differ from image processing?	2
Q.14	Once the model is created, evaluating it is inevitable. While evaluating, there are some ethical concerns to be considered. Discuss.	2
Q.15	Write about the learning model which requires complex computing power and state why.	2
Q.16	What makes reinforcement learning different from supervised and unsupervised learning. Give two applications of Reinforcement learning.	2

	Answer any 3 out of the given 5 questions in 50-80 words each. $3 \times 4 = 12$	
Q.17	<p>a) Write about the ethical framework used in healthcare b) Identify the ethical principle being demonstrated in each scenario:</p> <p>1. A government health program decides to equally distribute a new, costly AI diagnostic tool across all public hospitals, ensuring that the benefits of the technology are not limited only to wealthy urban areas.</p> <p>2. A patient is diagnosed with a rare condition. The doctor explains two equally viable treatment options (A or B), their associated risks, and potential success rates, and then asks the patient to decide which option they wish to pursue.</p> <p>3. A hospital uses an AI system to analyze patient data specifically to identify high-risk individuals for early intervention, with the sole aim of improving patient health outcomes and overall survival rates.</p> <p>4. Before administering a new drug, a nurse meticulously checks the patient's allergy history and verifies the medication dosage three times against the doctor's order to prevent any potential adverse reactions or complications.</p>	2+2
Q.18	Consider the below diagram and identify the learning approach adapted by the model. Describe the features and working of its layers and an application.	4
Q.19	 <p>Identify the name of the application of AI/ machine learning or deep learning being used in the following scenarios with justifications.</p> <p>a) A virtual art app allows users to paint doodles with their fingers. The AI identifies the drawing and suggests additional creative enhancements automatically.</p>	4

	<p>b) A mobile game app observes how players move in the game environment, and over multiple rounds, it learns which moves earn higher points. The AI then adapts to play more efficiently.</p> <p>c) A grocery store installs AI-powered cameras that scan shelves in real time and detect when products are running low. The system automatically generates a restocking alert for each item.</p> <p>d) A smartphone app monitors incoming messages and classifies each message as "Important" or "Not Important" based on keywords, sender, and context. This allows the app to alert the user only for important messages.</p>	
Q.20	<p>A bank AI predicts whether a loan application should be "Approved" or "Rejected." Results for 40 applicants are</p> <p>10 applications were actually eligible and approved by the model.</p> <p>2 applications were eligible but rejected by the model.</p> <p>20 applications were not eligible, and the model correctly rejected them.</p> <p>8 applications were not eligible but approved by the model.</p> <p>a) Construct the confusion matrix b) Calculate the Precision. c) Calculate the Total Number of Wrong predictions made by the model.</p>	2+1+1
Q.21	<p>A weather department collected user messages about daily weather conditions. The messages before preprocessing were:</p> <p>Message 1: "Rain is expected today!" Message 2: "It will be a sunny day, expected by noon." Message 3: "Strong wind and rain expected today."</p> <p>After basic text preprocessing (removing punctuation, converting to lowercase, and tokenizing), the messages became:</p> <p>Message 1: [rain, is, expected, today] Message 2: [it, will, be, a, sunny, day, expected, by, noon] Message 3: [strong, wind, and, rain, expected, today]</p> <p>Based on the processed messages, answer the following as part of ONE single question:</p> <p>a) Create the vocabulary (list of all unique words). b) Construct the document vector for Message 2 using this vocabulary. c) Why is document vector important ? d) State one application of TFIDF.</p>	4

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