केंद्रीय विद्यालय संगठन, बेंगलुरु संभाग

KENDRIYA VIDYALAYA SANGATHAN, BENGALURU REGION

प्रथम प्री-बोर्ड परीक्षा 2025-26

FIRST PREBOARD EXAMINATION 2025-26

Class: X **Maximum Marks: 50**

Subject: ARTIFICIAL INTELLIGENCE (417) **Time: 2 HRS**

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

Q.1	**Answer any 4 out of the given 6 questions on Employability skills (4X1=4 Marks)**	
i	Which of the following is an example of a physical barrier to effective communication? a) Noise and poor network connectivity b) Prejudice and bias c) Lack of trust between sender and receiver d) Use of complex words	1
ii	Naseema lists her priorities for the day and works on the most important tasks first. What self-management skill does this represent? a) Procrastination b) Time management c) Overplanning d) Task shifting	1

iii	'Prepare yourself for new changes, so that you can transition seamlessly'. Which term can you relate the given sentence to? a) Self-awareness b) Responsibility c) Adaptability d) Time-management	1
iv	Anjali is working on her school project on her computer. She notices that her inbox is full of emails promoting online shopping, fake contests, and random advertisements. At the same time, her computer storage has unnecessary files that she never created or downloaded. The unnecessary emails and files that Anjali receives are commonly referred to as: a) Important system files b) Unwanted junk emails or files c) Program installation files d) Media files like videos and music	1
v	Which of the following is not true about the SDGs ? a) They encourage the promotion of health, well-being, and education for all, at all ages b) They include the development of sustainable cities, infrastructure, and industry c) They are an optional choice for nations to follow d) They explicitly promote innovation	1
vi	An individual who chooses entrepreneurship as a career is motivated by: a) Creativity and freedom b) Unemployment only c) Fixed salary every month d) Avoiding responsibilities	1
Q.2	**Answer any 5 out of the given 6 questions (5X1= 5 Marks)**	
i	**Assertion (A):** Data acquisition is the process of collecting relevant data for the AI model. **Reason (R):** The quality and quantity of data have little impact on the performance of an AI model. 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	An AI tool analyzes millions of medical records to identify patterns that predict the early onset of diabetes. Which domain of AI is used? a) Robotics b) Computer Vision c) Data Science d) NLP	1
iii	If an AI system is trained on biased data and causes misdiagnosis in certain ethnic groups, what should be done first according to BioEthics principles? a) Deploy it anyway to save time b) Replace human doctors with AI to reduce costs c) Review and rebalance the training data to reduce bias d) Hide the data sources from the public	1
iv	Bhavith is learning to create NLP based programs. In one of his text normalization programs, he used the following words :	1

	'crying', 'cried', 'smiling', 'smile', 'smiled' And the program returned: 'cry', 'cri', 'smil', 'smile', 'smile' Which of the following techniques did he use in his program? (a) Tokenization (b) Bag of Words (c) Stemming (d) Lemmatization	
v	The _____ stage is crucial for ensuring the successful integration and operation of AI solutions in real-world environments, enabling them to deliver value and impact to users and stakeholders. A) Evaluation C) Deployment B) Data Acquisition D) Data Exploration	1
vi	Rutgers' archive has installed a chatbot for its users where users can ask about the articles and paper stored in the archive. However, all the details, rules and information about the articles and research papers is already fed in the chatbot program and won't alter anytime. What type of chatbot is it? a) Text based b) Voice based c) Script bot d) Smart	1
Q.3	**Answer any 5 out of the given 6 questions (5X1= 5 Marks)**	
i	A grocery store uses AI to identify that: • "Customers who purchase milk and cereals often buy bananas too." • "Customers who buy **mobile phones** often purchase **phone cases** or **screen protectors**." • " People who add **baby diapers** to their cart frequently buy **baby wipes** and **baby lotion**." This insight comes from Association Model which is an example of: **a)** Supervised Learning **b)** Unsupervised Learning **c)** Reinforcement Learning **d)** Semi-supervised Learning	1
ii	A bank wants to predict whether a new customer is likely to default on a loan based on past data labeled as "default" or "no default." Which learning approach is being applied? a) Supervised Learning – Classification b) Unsupervised Learning – Clustering c) Reinforcement Learning d) Association Rule Learning	1
iii	What happens when a Rule-based AI encounters a situation not covered by its existing rules? a) It learns from experience b) It generates a new rule automatically c) It may fail to give a correct output d) It generalizes the situation	1
iv	Which of the following is the best example of a problem to be solved using regression model? A) Predicting whether an email is spam or not. B) Predicting the price of a house based on its size and location. C) Grouping customers based on shopping habits. D) Finding which products are bought together	1

v	The nodes in ANN are called: a) Neurons b) Layers c) Clusters d) Rules	1
vi	An RGB image contains: a) Only one channel b) Three channels – Red, Green, and Blue c) Four channels – Red, Green, Blue, Alpha d) Only black and white information	1
Q.4	**Answer any 5 out of the given 6 questions (5X1= 5 Marks)**	
i	----------is an NLP technique where a computer program shortens longer texts and generates summaries to pass the intended message as the most important information is retained. a) Automatic text summarization b) Text classification c) Chatbot d) Sentiment analysis	1
ii	Which of the below is not a Computer Vision Task? A) Object Detection B) Instance Segmentation C) Image Classification D) Sentiment Analysis	1
iii	_____ is an abbreviated word of picture element.	1
iv	Typically, in a train-test split, what percentage of data is used for training? a) 10–20% b) 30–50% c) 70–80% d) 90–100%	1
v	In a disease detection model, missing an actual patient (False Negative) is more serious than wrongly flagging a healthy person (False Positive). Which metric should be prioritized in the AI Model? a) Precision b) Recall c) Accuracy d) F1 Score	1
vi	**Precision measures:** a) Correct positive predictions ÷ All predicted positives b) Correct negative predictions ÷ All actual negatives c) Total correct predictions ÷ Total predictions d) Correct positive predictions ÷ All actual positives	1
Q.5	**Answer any 5 out of the given 6 questions (5X1= 5 Marks)**	
i	In the model evaluation phase, transparency means: a) Hiding the model's internal logic to protect company data b) Clearly explaining the model's performance, limitations, decision factors and evaluation metrics c) Using only open-source tools for evaluation d) Sharing all data publicly	1
ii	A bank uses an AI model to detect fraudulent transactions. The team realizes that while the model catches most frauds, it also flags some genuine transactions as fraud. It is important for the bank to **not miss** any fraud cases (false negatives) but also, they should **not** accuse honest users wrongly (false positives). Which evaluation metric should the team focus on to balance both false positives and false negatives in this scenario? a) Accuracy b) Precision c) Recall d) F1 Score	1

iii	Given the confusion matrix for a classification model that detects spam emails, find out how many spam mails are in reality? **CONFUSION MATRIX** — **PREDICTION** → **REALITY** ↓ |	**SPAM**	**NOT SPAM**
SPAM	190	100
NOT SPAM	140	200 | A) 190 + 140 = 330 C) 190 + 100 = 290 B) 140 + 200 = 340 D) 100 + 200 = 300	1
iv	-------- is a model used for extracting features from the text for use in AI based modelling. a) Text normalisation b) Sentence segmentation c) Bag of words d) None of these	1
v	_____is an NLP tool to express an opinion, whether the underlying sentiment is positive, negative, or neutral. a. Text Classification b. Machine Translation c. Sentiment Analysis d. Automatic Text Summarization	1
vi	_____ are the words in any language which do not add much meaning to a sentence. They can safely be ignored without sacrificing the meaning of the sentence.	1

SECTION B: SUBJECTIVE TYPE QUESTIONS

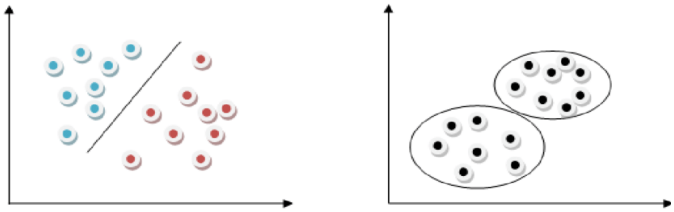
Answer any 3 out of given 5 questions on Employability skills (3X2=6 marks)

Answer each question in 20-30 words

Q.6	Why is feedback considered important in communication?	2
Q.7	*Riya feels anxious and tired after long hours of studying for exams.* Suggest two stress management techniques she can use and explain why.	2
Q. 8	Enlist any two measures that an individual should follow to take care of his/her digital devices.	2
Q.9	What are the myths regarding entrepreneurship?	2
Q.10	As an individual, what steps can you take to contribute towards the SDG 12 – Responsible Consumption and Production? Write any 4 such steps.	2

Answer any 4 out of the given 6 questions in 20-30 words each (2X4= 8 marks)

Q.11	Draw the confusion matrix for the following. The number of True Positive=123 The number of True Negative=46 The number of False Positive=23 The number of False Negative=12	2

Q.12	What do you understand by overfitting?	2
Q.13	 Fig1 Fig2 Observe the graphs (Fig1 & Fig 2) that demonstrates the two types of learning models. Identify them and differentiate between them.	2
Q.14	Write any 4 applications of Computer Vision.	2
Q.15	Your school wants to create an AI model to detect if students are wearing proper uniform using CCTV footage. a) Which AI domain will be used? b) Which stage of the AI Project Cycle will involve analyzing CCTV images?	2
Q.16	What is tokenization? Give example.	2

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

Q.17	Why is it important to follow ethical guidelines when developing AI systems? Name and explain the three types of value-based frameworks used in AI ethics.	4
Q.18	Describe what neural networks are and explain the roles of their three main layers.	4
Q.19	Identify the type of model (**classification, regression, clustering, association model**) and justify the following case studies most likely based on? **Case Study 1**: A school wants to determine whether students will pass or fail a standardized exam based on features such as attendance, homework completion rate, quiz scores, and participation. **Case Study 2**: An agricultural analytics company wants to find combinations of fertilizers and crop types that are frequently used together across different farms, to optimize supply chain and product bundling. **Case Study 3**: An investment firm wants to predict the future stock price of a company based on historical stock data, trading volume, market indicators, and financial reports. **Case Study 4**: A marketing company wants to segment its customer base into distinct groups based on purchasing behaviour for targeted marketing campaigns. They have a dataset containing information such as purchase history, frequency of purchases, and amount spent.	4

<table>
<tr><td>Q.20</td><td>Due to an increase in global seismic activity, scientists designed an AI-based earthquake early warning system. During testing on 150 cases, the following results were obtained:

<table>
<tr><td>CONFUSION MATRIX</td><td>Predicted: Earthquake</td><td>Predicted: No Earthquake</td></tr>
<tr><td>Actual: Earthquake</td><td>50</td><td>10</td></tr>
<tr><td>Actual: No Earthquake</td><td>20</td><td>70</td></tr>
</table>

(a) How many total predictions were correct?

(b) Compute Precision, Recall, and F1-Score</td><td>4</td></tr>
<tr><td>21</td><td>How would you normalize the following documents? Show each step and the final normalized text:

D1: Johny Johny, Yes Papa,
D2: Eating sugar? No Papa
D3: Telling lies? No Papa
D4: Open your mouth, Ha! Ha! Ha!</td><td>4</td></tr>
</table>

****