B.K. BIRLA CENTRE FOR EDUCATION

SARALA BIRLA GROUP OF SCHOOLS
A CBSE DAY-CUM-BOYS' RESIDENTIAL SCHOOL

PRE BOARD-II EXAM : 2025-26
ARTIFICIAL INTELLIGENCE (417)

Class: X (SET 01) **Time : 2 Hrs.**
Date: 15-12-2025 **Max Marks: 50**
Admission No. : …..…… **Roll No. :**

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 question.*
   - ii. *Marks allotted are mentioned against 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.*

MARKING SCHEME

SECTION A: OBJECTIVE TYPE QUESTIONS

Q.(1) Answer any 4 out of the given 6 questions on Employability Skills. **(4 x 1 = 4)**

(i) (d) Time
(ii) (d) Time management
(iii) (b) Understanding inner strength, hidden talents, skills and weaknesses
(iv) (c) .jpg
(v) (c) patient
(vi) (d) Minimizing waste and pollution

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

(i) (d) Data generation
(ii) (b) Problem scoping and developing a vision
(iii) Job loss / unemployment
(iv) (b) Healthcare and life sciences

(v) False
(vi) Training data

Q.(3) Answer any 5 out of the given 6 questions. **(5 x 1 = 5)**
(i) (d) Recommendation systems
(ii) (c) Reward and penalty feedback
(iii) (c) CNN
(iv) (b) Precision
(v) (b) Actual
(vi) (b) Credit card fraud

Q.(4) Answer any 5 out of the given 6 questions. **(5 x 1 = 5)**
(i) (c) Train-test split
(ii) (c) Directly proportional
(iii) False
(iv) (b) White
(v) (b) Video and image data
(vi) (c) Both (a) and (b)

Q.(5) Answer any 5 out of the given 6 questions. **(5 x 1 = 5)**
(i) (c) The image looks more detailed and closer to the original
(ii) (b) To help machines understand and use human language
(iii) (c) Machine learning and deep learning
(iv) Chat Assistant / Virtual Assistant / Conversational Agent
(v) (b) Term Frequency and Inverse Document Frequency
(vi) (a) Pragmatic Analysis

SECTION B: SUBJECTIVE TYPE QUESTIONS

Answer any 3 out of the given 5 questions on Employability Skills. **(3 x 2 = 6)**
Answer each question in 20-30 words.

Q6. Name and discuss any two types of barrier in communication.

Answer:

1. **Language Barriers:** Use of difficult vocabulary, unfamiliar accents or technical jargon creates misunderstanding.
2. **Physical Barriers:** Noise, distance, faulty equipment or poor connectivity interrupt the communication process and reduce message clarity.

Q7. Write and explain any four stress management techniques.

Answer:
Common stress management techniques include **deep breathing** for relaxation, **physical exercise** for reducing tension, **time management** for reducing workload pressure, and **meditation** for calming the mind and improving focus.

Q8. Methods to enhance laptop speed and efficiency for Nitya.

Answer:
Nitya can improve her laptop performance by **upgrading RAM**, **deleting temporary files**, **uninstalling unused programs**, **running antivirus scans**, and **performing system updates** to increase speed and overall efficiency.

Q9. Difference between wage-employed and self-employed people.

Answer:
Wage-employed people work for an employer and earn a fixed salary.

Self-employed people run their own business or service, take risks, and earn profits based on their efforts.

Q10. Two advantages of using Kulhads.

Answer:
Kulhads are **eco-friendly and biodegradable**, reducing plastic waste. They also **support traditional potters** and enhance the natural flavour of beverages without harmful chemicals.

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

Q11. Explain the 4W Problem Canvas used in AI Project Cycle.

Answer:
The 4W canvas includes: **Who** faces the problem, **What** the problem is, **Where** it occurs, and **Why** it must be solved. It helps clearly define AI project objectives.

Q12. Full form of CNN and how it processes data.

Answer:
CNN stands for **Convolutional Neural Network**. It processes data through **convolution layers** for feature extraction, **pooling layers** for dimensionality reduction, and **fully connected layers** for classification.

Q13. What is regression? Give two examples.

Answer:
Regression predicts **continuous values**. Examples include predicting **house prices** based on features and forecasting **sales revenue** using past business data.

Q14. List and explain different evaluation models.

Answer:
Common evaluation models include **Accuracy** (overall correctness), **Precision** (correct positive predictions), **Recall** (ability to detect actual positives), and **F1-score**, which balances precision and recall.

Q15. Differentiate between Computer Vision and Image Processing.

Answer:
Computer Vision focuses on **understanding images** (object detection, recognition), while Image Processing focuses on **enhancing images** (filtering, resizing). CV uses AI; image processing uses mathematical transformations.

Q16. Difference between stemming and lemmatization.

Answer:
Stemming cuts word endings to give a rough root (play→play).

Lemmatization converts words to correct dictionary forms (better→good) using grammar rules, giving more accurate results.

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

Q17. Identify the correct terms 1, 2, 3, 4 and explain them.

Answer:

1. Sector-Based Framework

A sector-based ethical framework focuses on making AI ethical guidelines specific to different industries or sectors.
Different sectors have different risks, needs, and rules. Therefore, the ethical principles for AI in each sector are customized.

2. Rights-Based Framework

A rights-based framework ensures that AI systems protect and respect human rights.
It focuses on fairness, dignity, equality, and freedom.

3. Utility-Based Framework (Utilitarian Approach)

This framework is based on the idea of **maximizing overall benefit and minimizing harm**.
AI decisions are judged ethical if they create the greatest good for the greatest number of people.

4. Virtue-Based Framework

A virtue-based framework focuses on the character and moral values of the people who design, develop, and use AI.

Q18. Explain the relationship between AI, ML and DL with a neat diagram.

Answer:
Artificial Intelligence (AI) is the broad field that enables machines to mimic human intelligence.
Machine Learning (ML) is a subset of AI where machines learn patterns from data without explicit programming.
Deep Learning (DL) is a subset of ML that uses multi-layered neural networks for complex tasks such as speech and image recognition.

Q19. What is a Neural Network? Explain the functions of its three layers.

Answer:
A neural network is a computational model inspired by the human brain.

- **Input Layer:** Receives raw data.
- **Hidden Layers:** Perform mathematical computations, extract patterns, and learn relationships.
- **Output Layer:** Produces the final prediction or classification.
  Together, these layers help solve tasks like image recognition, language processing, and decision-making.

Q20. Confusion matrix, precision, recall and F1-score.

Answer:
Confusion Matrix:

- TP = 120
- FP = 20
- TN = 800
- FN = 60

Precision = TP / (TP + FP) = 120 / 140 = **0.857**
Recall = TP / (TP + FN) = 120 / 180 = **0.667**
F1-Score = 2 × (Precision × Recall) / (Precision + Recall) ≈ **0.75**
These metrics show how accurately the model identifies disease cases.

Q21. Perform text normalization on the sentences.

Given:
Document 1: Akash and Ajay are best friends.
Document 2: Akash likes to play football but Ajay prefers to play online games.

Answer:
After normalization:

- **Document 1:** akash ajay best friend
- **Document 2:** akash play football ajay prefer play online game

Steps used: lowercasing, removing stop words (and, are, to, but), removing punctuation, converting words to their base forms.

********** ALL THE BEST **********