B.K. BIRLA CENTRE FOR EDUCATION

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

PRE BOARD - II (2025-26)
ARTIFICIAL INTELLIGENCE (843) / SUBJECT-05

Set-01 / 843

Class : XII A/B/C **Duration: 2 Hrs.**
Date : 11-12-2025 **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 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 (1 x 4 = 4 marks)**

i. Which of the following is not a way to maintain positive outlook in the long run ? 1
(*a*) Physical exercise and Fresh air (*b*) Healthy diet
(*c*) Not going out for vacations (*d*) Organised academic life

ii. Rohit is a manager in an organization. Due to some bad incident a few days ago, he is feeling upset, annoyed and hopeless. This state of his mind is categorized as : 1
(*a*) Criminal (*b*) Happiness (*c*) Inferiority complex (*d*) Stress

iii. ..... is an element of communication which encodes and sends messages through a channel. 1
a) Receiver b) Message c) Sender d) Feedback

iv. An indirect object answers the questions, such as: 1
a) What? b) Why? c) To whom? d) Which?

v. Which of the following is an importance of Green Jobs? 1

(*a*) Identify more areas to dump waste (*b*) Creating more IT-related jobs
(*c*) To protest against the use of solar fuels (*d*) Protecting and restoring the ecosystem

vi. Electronic waste, as known as e-waste, is generated when any electronic or electrical equipment becomes unfit for the intended use or if it has crossed its expiry date. Due to rapid technological advancements and the production of newer electronic equipment, the old ones get easily replaced with new models. It has particularly led to an exponential increase in e-waste in India. 1

Which of the following is the correct way to handle e-waste?
a) Sell the e-waste to a local scrap dealer b) Throw the e-waste in the dustbin
c) Dispose-off the e-waste with the help of a certified partner
d) Dump the e-waste in the local landfill

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

i. _____ is a process with a prescribed sequence of iterative steps that data scientists follow to approach a problem and find a solution. 1
a) Machine Learning b) Data Science Lifecycle c) Deep Learning d) Data Visualization

ii. In Design Thinking, phase involves gathering user feedback on the prototypes you've created as well as obtaining a better understanding of your users. 1
a) Prototype b) Test c) Ideate d) Empathize

iii. Feedback is the last stage of data science methodology that helps to refine the model and assess it for performance and impact. **(*State whether this is True/False*)** 1

iv. Match the following: 1

1) Which category?	A. (Anomaly Detection)
2) How much or how many?	B. (Regression)
3) Which group?	C. (Recommendation)
4) Is this unusual?	D. (Classification)
5) Which option should be taken?	E. (Clustering)

a) 1=D, 2=B, 3=E, 4=A, 5=C
b) 1=C, 2=D, 3=B, 4=E, 5=A
c) 1=D, 2=B, 3=C, 4=E, 5=A
d) 1=E, 2=A, 3=D, 4=C, 5=B

v. Identify two AI development tools from the following: 1
1) DataRobot 2) Python 3) Scikit Learn 4) Watson Studio

(a) 1 & 2 (b) 2 & 3 (c) 1 & 3 (d) 1 & 4

vi. Which of the following shows the correct sequence of steps to create a story through data? 1

(*a*) Create narrative →Collect data →Observe relationships →Visualize data
(*b*) Visualize data →Collect data →Create narrative →Observe relationships
(*c*) Observe relationships →Visualize data →Collect data →Create narrative
(*d*) Collect data →Visualize data →Observe relationships →Create narrative

Q. 3 Answer any 5 out of the given 6 questions (1 x 5 = 5 marks)

i. What is the main goal of feature engineering in machine learning? 1
(*a*) To increase the size of the dataset (*b*) To reduce the number of algorithms required
(*c*) To select, modify, or create new features to improve model performance
(*d*) To visualize the dataset using graphs and charts

ii. Which two methods are commonly used for processing data in analytics? 1
(*a*) Classification and Clustering (*b*) Normalization and Augmentation
(*c*) Batch Processing and Stream Processing **(***d*) Preprocessing and Evaluation

iii. You want to predict future house prices. The price is a continuous value, and therefore we want to do regression. Which loss function should be used here? 1
(a) RMSE (b) MSE (c) Exponential error (d) MAE

iv. The design phase of the AI Model Life Cycle is a process. 1
(a) compact (b) permanent (c) periodic (d) iterative

v. In a neural network, how does learning primarily occur during training? 1
(*a*) By increasing the number of input features (*b*) By deleting unnecessary neurons
(*c*) By adjusting weights and biases using a learning rule (*d*) By reducing the number of hidden layers

vi. ____is the first step involved in telling an effective data story. 1
(a) Creating visuals (b) Adding narrative
(c) Understanding the Audience (d) Gathering data

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

Assertion and Reasoning questions:
Direction: Questions i-ii, consist of two statements – Assertion (A) and Reasoning (R). Answer these questions by selecting the appropriate option given below:
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.

i. **Assertion (A)** : Personality traits are defined as relatively lasting patterns of thoughts, feelings and behaviors. **Reasoning (R)** : They distinguish individuals from one another. 1

ii. **Assertion (A)** : Stories that combine statistics and analytics are more persuasive. 1
Reasoning (R) : When we talk about data storytelling, we're talking about stories in which data plays a central role.

iii. A ___is defined as one that helps bring about and maintain transition to environmentally sustainable forms of production and consumption. 1
(a) Blue collar job (b) White collar job (c) Yellow job (d) Green job

iv. With reference to AI Model Life Cycle, which of the following is true for Building the Model? 1
(a) This is arguably the most important part of your AI project.
(b) Phrase that characterizes this project stage "garbage in, garbage out".
(c) This stage involves the planning and motivational aspects of your project.
(d) It is essentially an iterative process comprising all the steps relevant to building the AI or machine learning model.

v. The train-test procedure is appropriate when there is a sufficiently _____ data sets available. 1
(a) Comparative (b) Large (c) Small (d) Equal

vi. RMSE stands for _____ 1
(a) Root Median Squared Error (b) Radian Mean Squared Error
(c) Root Mean Search Error (d) Root Mean

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

Assertion and Reasoning questions:
Direction: Questions i-ii, consist of two statements – Assertion (A) and Reasoning (R). Answer these questions by selecting the appropriate option given below:
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.

i. **Assertion (A):** Characters are essential in a story as they perform actions and drive the narrative forward. 1
Reason (R) : Plot refers to the events of the story, and setting refers to the time and place where

ii. **Assertion (A):** With reference to Data storytelling, narrative is the way we simplify and make sense of a complex world. 1
Reason (R) : Narrative explains what is going on within the dataset.

iii. Reva is a high school student working on a project to predict students' final grades based on their attendance, homework scores, and test performance. She builds a machine learning model and evaluates it on the same data she used to train it. The model shows 98% accuracy. 1
Her mentor suggests that this may not reflect the model's true performance on new data and recommends a better technique. So, Reva splits the dataset into ***several*** parts. She trains the model on some parts and tests it on the remaining ones. She repeats this process multiple times to get a more reliable performance score.
Which model evaluation technique is Reva using to get a more accurate understanding of her model's performance?
(*a*) Confusion Matrix (*b*) Cross Validation
(*c*) Hyperparameter Tuning (*d*) Feature Engineering

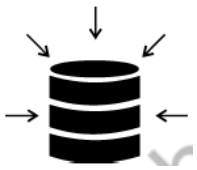
iv. Match Column A with Column B 1

Column A	**Column B**
1. Edge Detection	i. Measures smoothness or roughness
2. Corner Detection	ii. Analyzes colour distribution
3. Texture Analysis	iii. Finds where edges meet
4. Colour-Based Feature Extraction	iv. Detects sharp changes in intensity

(*a*) 1 →iv, 2 →iii, 3 →i, 4 →ii (*b*) 1 →ii, 2 →i, 3 →iv, 4 →iii
(*c*) 1 →i, 2 →ii, 3 →iii, 4 →iv (*d*) 1 →iii, 2 →iv, 3 →ii, 4 →i

v. Which technology raises concerns about the authenticity of digital content and the spread of misinformation? 1
(*a*) Deepfake AI (*b*) Generative Adversarial Networks (GANs)
(*c*) Variational Autoencoders (VAEs) (*d*) Convolutional Neural Networks (CNNs)

vi. Identify the given element that makes a compelling data story and choose its correct name from the following options: 1



(a) Graphs (b) Numbers (c) Story (d) Data

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. Briefly explain the following terms: 2
(a) Personality (b) Personality disorders

Q 7. What do you mean by interpersonal skills? Why is it important for an entrepreneur to possess it? Briefly discuss ? 2

Q 8. 'Receiving' is the first stage of active listening. Name the other four stages. 2

Q 9. List few environmental barriers to becoming an entrepreneur. 2

Q 10. Is rain water harvesting a green job ? Why / Why not ? 2

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

Q 11. What is the purpose of a Confusion matrix in evaluating a classification model ? 2

Q 12. Imagine that you want to create your first app. Create a list of questions you would develop to decompose this task. 2

Q 13. "Once the relevant projects have been selected and properly scoped, the next step of the machine learning lifecycle is the Design or Build phase." Briefly explain this phase. 2

Q 14. How does a node in a neural network determine whether to pass data to the next layer? 2

Q 15. List any two applications of text generation and also describe them. 2

Q 16. What are the key elements of a story ? 2

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

Q 17. A government agency wants to predict and prevent traffic congestion in a smart city using big data analytics. 4
a) What data sources should be considered?
b) Which characteristic of Big Data (6Vs) is most relevant in this scenario?
c) How can machine learning help in predicting traffic patterns?
d) What prescriptive analytics strategies can be used to reduce congestion?

Q 18. A machine learning model was developed to detect whether an email is Spam or Not Spam. The following confusion matrix shows the model's performance on the test data: 4

Confusion Matrix

	Predicted Spam	**Predicted Not Spam**
Actual Spam	**80**	**20**
Actual Not Spam	**10**	**90**

Using the given matrix, answer the following:
a) Calculate the Accuracy of the model.
b) Calculate the Precision for the "Spam" class.
c) Calculate the Recall for the "Spam" class.
d) Calculate the F1 Score for the "Spam" class.

Q 19. Explain the terms given below with an example. 4
a) Perceptron b) Convolutional Neural Network c) Recurrent Neural Network
d) Generative Adversarial Network

Q 20. A marketing agency, "Creative Horizons", leverage Generative AI technologies to enhance its campaign strategies. The agency uses various AI models for creating unique advertising content, including Al-generated images, personalised text for email campaigns, dynamic video ads, and innovative audio jingles. One of their key projects involves launching a new line of eco-friendly products for a client. The campaign's success hinges on the uniqueness and engagement of the generated content, aiming to highlight the product's sustainability features innovatively. 4

a) What are the primary types of AI models used by "Creative Horizons" for their campaign?
b) How does Generative AI contribute to creating personalised email campaign content?
c) Identify one potential ethical consideration the agency must address when using Generative AI in advertising.
d) What is the significant advantage of using Generative AI for dynamic video ad creation ?

Q 21. A city government analysed traffic data to identify problem areas and reduce congestion. They collected data on peak traffic hours, accident hotspots, and average vehicle speeds across key intersections. Using this data, they created a data storytelling report to propose changes such as new traffic signals, optimised routes, and better public transport options. 4

Answer the following questions based on the above case study:
a) What was the primary goal of the city government's data storytelling report?
b) What type of data did the city government primarily analyse?
c) What is a possible recommendation from the data storytelling report?
d) Which of the following tools would best help visualise the traffic data?

******* BEST OF LUCK *******