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-02 / 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. ..... is an element of communication which encodes and sends messages through a channel. 1
a) Receiver b) Message c) Sender d) Feedback

ii. 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

iii. "I enjoy singing and practice it as it gives me a lot of pleasure. It also works as a stress buster." 1
The sentence given above is an example of:
a) Intrinsic motivation b) Extrinsic motivation c) External motivation d) Lack of motivation

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. During a group discussion, Priya is explaining her point of view on a project idea. Midway through her explanation, Arun interrupts and starts sharing his own thoughts without letting Priya complete her sentence. If you were in Arun's place and wanted to follow the T of RESPECT in active listening, what should you do? 1
a) Interrupt politely if you feel your point is important.
b) Start speaking as soon as you think you understand her point.
c) Speak at the same time so both ideas are heard together.
d) Wait until Priya finishes speaking, then respond to her points.

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

i. What happens when you change the layout of a slide? 1
a)The arrangement of content (text, images, shapes) changes
b) The format of the text changes
c) New slide is inserted
d) The title gets aligned to the centre of the slide

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. During Train-Test split evaluation, we usually split the data around _____ between testing and training stages.
(a) 90% – 10% (b) 20% – 80% (c) 100% – 0% (d) 0% – 100%

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) Data Robot 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. Choose the difference between Regression and Classification Loss functions from the following: 1
(a) Regression functions predict a quantity, and classification functions predict a label.
(b) Regression functions predict a label, and classification functions predict a quantity.
(c) Regression functions predict a qualitative value, and classification functions predict a label.
(d) Regression functions predict a label, and classification functions predict a qualitative value.

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

iv. The design phase of the AI Model Life Cycle is an 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. 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

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)** : Economists, psychologists, sociologists, and management experts define entrepreneurs differently. 1
Reasoning (R) : The definition of an entrepreneur varies depending on whether the focus is on resources, psychological drive, societal contribution, or vision with action.

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. A good model should have an _____ value less than 180. 1
(a) RMSE (b) MSE (c) Focal Loss (d) MAE

vi. Appropriate technology is small-scale, environment-friendly technology suited to local needs. It gets the job done using locally available resources in a sustainable manner. 1
(State whether this is True/False)

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.

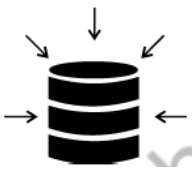
iii. Reva is a high school student working on a project to predict students' final grades based on their attendance, homework scores, and test performance. She builds a machine learning model and evaluates it on the same data she used to train it. The model shows 98% accuracy. 1
Her mentor suggests that 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. 1

The given diagram shows the working of a vision-based system that identifies objects in an image. What is the other name for this technology?

v. Data Modelling focuses on developing models that are either descriptive or _____. 1
(a) Inclusive (b) Predictive (c) Selective (d) Reactive

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. Difference between "Sentence" and "Phrase" with the help of suitable example. 2

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

Q 8. Jahanvi is working on a spreadsheet. She wants to calculate the sum of cells B2 and C2, in the cell D2. For this she has entered the formula as shown in the following image. But, instead of the sum, she is getting the text B2 + C2 in the cell D2. 2

D2 ⋮ × ✓ f_x B2+C2

	A	B	C	D
1	**Sno.**	**Value1**	**Value2**	**Total**
2	1	55	12	B2+C2
3	2	36	13	
4	3	72	18	
5	4	17	14	

(a) What correction should be made in the cell D2 so as to get the desired sum?
(b) If the corrected formula is copied from cell D2 to D3, what value will it show in D3?

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

Q 10. The greening of economy presents a major opportunity to start new businesses, develop new markets and lower energy costs. Write any two benefits of green jobs. 2

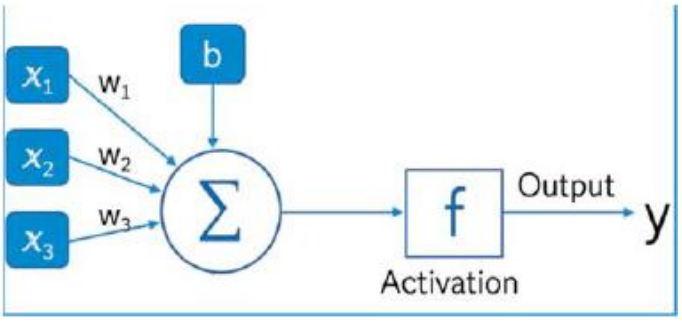
Answer any 4 out of the given 6 questions in 20 – 30 words each (2 x 4 = 8 marks)

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. What are the following known as in the given neural network? 2



1. (i) (X1, X2, X3) (ii) b
2. Write the formula for calculating the predicted output.

Q 15. What is a loss function ? Write the two categories of loss functions. 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 data scientist builds a linear regression model to predict the price of used cars based on their age. For a set of 5 cars, the **actual prices** and **predicted prices** (in lakhs) are given below: 4

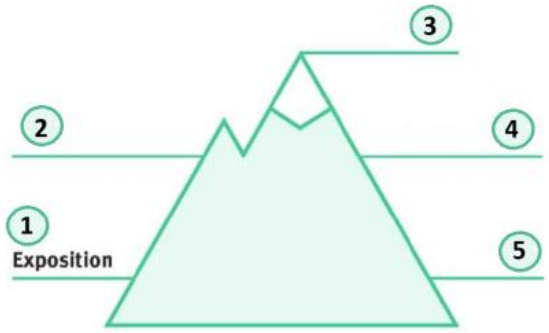
Car No.	Actual Price (A)	Predicted Price (P)
1	5.0	4.5
2	6.0	5.5
3	7.5	8.0
4	8.0	7.0
5	9.0	9.5

Using the data above:
a. Calculate the Mean Squared Error (MSE).
b. Calculate the Root Mean Squared Error (RMSE).

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. The image illustrates Freytag's Pyramid, a classic narrative structure. While **(1) Exposition** introduces the story and characters, identify and briefly explain the stages labeled as **2**, **3**, **4**, and **5** in the diagram. 4



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 *******