केन्द्रीय माध्यमिक शिक्षा बोर्ड
दिल्ली
असतो मा सद्गमय

# Question Paper

## 2023

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Series ΣHEFG

Set-4

प्रश्न–पत्र कोड
Q.P. Code **367**

रोल नं.
Roll No.

परीक्षार्थी प्रश्न–पत्र कोड को उत्तर–पुस्तिका के मुख–पृष्ठ पर अवश्य लिखें ।
Candidates must write the Q.P. Code on the title page of the answer-book.

# ARTIFICIAL INTELLIGENCE

*निर्धारित समय : 2 घण्टे* | *अधिकतम अंक : 50*

*Time allowed : 2 hours* | *Maximum Marks : 50*

- Please check that this question paper contains **11** printed pages.
- Q.P. Code given on the right hand side of the question paper should be written on the title page of the answer-book by the candidate.
- Please check that this question paper contains **21** questions.
- **Please write down the serial number of the question in the answer-book before attempting it.**
- 15 minute time has been allotted to read this question paper. The question paper will be distributed at 10.15 a.m. From 10.15 a.m. to 10.30 a.m., the candidates will read the question paper only and will not write any answer on the answer-book during this period.

**General Instructions :**

*(i) Please read the instructions carefully.*

*(ii) This question paper consists of **21** questions in **two** Sections. Section – **A** & Section – **B**.*

*(iii) Section – **A** has objective type questions whereas Section – **B** contains subjective type questions.*

*(iv) 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.*

*(v) All questions of a particular section must be attempted in the correct order.*

*(vi) 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.*

*(vii) 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)

1. Answer any **4** out of the given **6** questions on Employability Skills. **4 × 1 = 4**

(I) Narcissistic personality disorder is characterized by which of the following condition(s) : **1**

i. People have an inflated sense of their own importance.

ii. A deep need for excessive attention.

iii. Admiration and lack of empathy.

iv. Introvert

(a) Only i (b) Both i and ii

(c) i, ii and iii (d) i, ii, iii and iv

(II) "S" in acronym SMART in Goal setting stands for : **1**

(a) Strong (b) Segment

(c) Specific (d) Special

(III) _____ is an economic process, where an idea is generated or an opportunity is created, refined, developed and implemented, while being exposed to uncertainty, to realise a profit by effective utilisation of resources. **1**

(a) Entrepreneurs

(b) Entrepreneurship development

(c) Entrepreneurship

(d) Cluster intervention

(IV) In a spreadsheet software, an arrangement of cells in a vertical manner is known as : **1**

(a) Worksheets (b) Workbooks

(c) Rows (d) Columns

(V) Which of the following is not an example of a spreadsheet ? **1**

(a) Microsoft Excel (b) LibreOffice Calc

(c) OpenOffice Impress (d) Google Sheets

(VI) Which entrepreneur, out of the following, is essentially a manufacturer, who identifies the needs of customers and creates products or services to serve them ? **1**

(a) Service entrepreneur

(b) Industrial entrepreneur

(c) Agricultural entrepreneur

(d) Technical entrepreneur

2. Answer any **5** out of the given **6** questions. **5 × 1 = 5**

(I) A training set is a set of _____ data in which the outcomes are already known. **1**

(a) current (b) instant

(c) historical (d) output

(II) _____ involves a combination of three key elements, that help to explain the audience whats happening in the data in an engaging and entertaining manner. **1**

(a) Data Analysis (b) Data Visualization

(c) Data Storytelling (d) Data Narrative

(III) Match the following step of AI project given in column 'A' with its exact sequence given in column 'B'. **1**

| Column 'A' | | Column 'B' | |
|---|---|---|---|
| 1. | Evaluation & refinements | A. | Second step |
| 2. | Problem definition | B. | Fifth step |
| 3. | Data gathering | C. | First step |
| 4. | Deployment | D. | Fourth step |
| 5. | AI model construction | E. | Sixth step |

| | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| (a) | D | E | A | B | C |
| (b) | C | B | A | E | D |
| (c) | B | C | A | E | D |
| (d) | E | D | B | C | A |

(IV) In AI development which of the following framework is used ? **1**

(a) Python (b) TensorFlow

(c) Visual Basic (d) C++

(V) All the algorithms in machine learning rely on minimizing or maximizing a function, called as _____. **1**

(a) Objective function (b) Focal Loss

(c) Loss function (d) Gradient Descent

(VI) Which of the following is incorrect ? **1**

(a) The testing phase is essentially an iterative process.

(b) The first fundamental step when starting an AI initiative is scoping.

(c) In scoping phase, it's crucial to precisely define the strategic business objectives and desired outcomes of the project,

(d) Test data should include all relevant subsets of training data.

3. Answer any **5** out of the given **6** questions. **5 × 1 = 5**

(I) When visuals are applied to data, they can _____ the audience to the insights that they wouldn't perceive without the charts or graphs. **1**

(a) engage (b) explain

(c) enlighten (d) change

(II) It is believed that if there is a _____ in the data, then AI development techniques may be employed. **1**

(a) pattern (b) program

(c) language (d) logic

(III) **Assertion (A) :** It's crucial to precisely define the strategic business objectives and desired outcomes of the project, align all the different stakeholders' expectations, anticipate the key resources and steps, and define the success metrics. **1**

**Reason (R) :** Selecting the AI or machine learning use cases and being able to evaluate the Return on Investment (ROI) is critical to the success of any data project.

Select the appropriate option for the statements given above :

(a) Both (A) and (R) are true and (R) is the correct explanation of (A).

(b) Both (A) and (R) are true and (R) is not the correct explanation of (A).

(c) (A) is true, but (R) is false.

(d) (A) is false, but (R) is true.

(IV) Which of the following shows the audience where to look and what not to miss and also keeps the audience engaged ? **1**

(a) data (b) narrative

(c) charts (d) story

(V) Once the relevant projects have been selected and properly scoped, which of the following phase will be the next step of the machine learning lifecycle ? **1**

(a) Problem Scoping (b) Deployment

(c) Design (d) Testing

(VI) Which of the following is the first stage of an AI Model Life Cycle ? **1**

(a) Build (b) Scoping

(c) Design (d) Testing

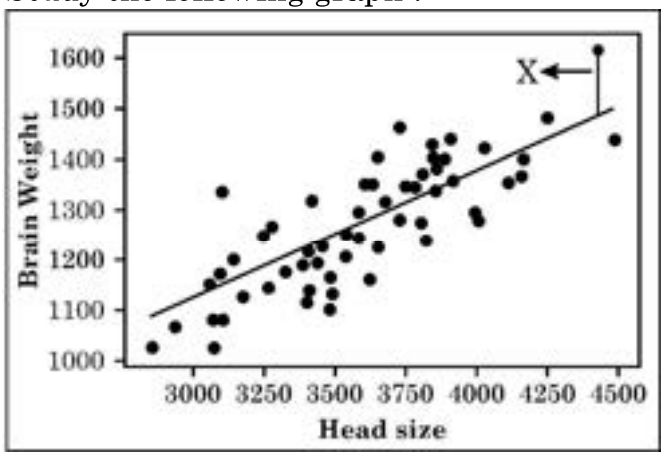
4. Answer any **5** out of the given **6** questions. **5 × 1 = 5**

(I) Which of the following is the most preferred language for building an AI model ? **1**

(a) Python (b) VB

(c) Java (d) C++

(II) Study the following graph : 1




What does the line in the above figure represent ?

(a) Actual values (b) Set of predicted values

(c) It represents the error (d) Values at Y aixs

(III) First four steps of writing Python code to find out RMSE values of the model are given here. Arrange them in proper order – 1

1. Splitting the data into training and test.
2. Reading the data.
3. Fitting simple linear regression to the training set.
4. Import required libraries

(a) 2 – 4 – 1 – 3 (b) 4 – 3 – 2 – 1

(c) 1 – 2 – 3 – 4 (d) 4 – 2 – 1 – 3

(IV) Which of the following is NOT True for Testing ? 1

(a) The volume of test data should be very small.

(b) Data validation is important.

(c) Your testing team should test the AI and ML algorithms keeping model validation.

(d) Your team must create test suites that help you validate your ML models.

(V) Data storytelling is a _____ approach for communicating insights drawn from data. 1

(a) iterative (b) procedural

(c) sequential (d) structured

(VI) Which of the following is NOT true for Train-Test Split Evaluation ? 1

(a) The procedure involves taking a dataset and dividing it into two subsets.

(b) The train-test procedure is appropriate when there is a larger dataset.

(c) The objective is to estimate the performance of the user.

(d) It can be used for classification or regression problems.

5. Answer any **5** out of the given **6** questions. **5 × 1 = 5**

(I) Stories create _____ experiences that transport the audience to another space and time. **1**

(a) visualizations (b) engaging

(c) testing (d) necessary

(II) Which of the following is incorrect ? **1**

i. A capstone project is a project where students must research a topic independently to find a deep understanding of the subject matter.

ii. The initial part of the project of academic program is known as capstone project.

iii. The final project of an academic program, integrating all of the learning from the program is called capstone project.

(a) i and iii only (b) ii and iii only

(c) ii only (d) i, ii and iii

(III) Which of the following is an example of a development tool used in building an AI model ? **1**

(a) C++ (b) Anaconda

(c) Linux (d) Scratch

(IV) Identify the correct statements from the following : **1**

i. Data modeling focuses on developing modes that are either descriptive or predictive.

ii. A predictive model tries to yield yes/no, or stop/go type outcomes.

iii. The data scientist will use a training set for descriptive modelling.

iv. Data modelling focuses on testing the project.

(a) i, ii, and iii (b) ii, iii and iv

(c) i and ii (d) i and iv

(V) _____ is a design methodology that provides a solution-based approach to solving problems. **1**

(a) Classification (b) Design Thinking

(c) Recommendation (d) Computational

(VI) Which of the following is a key element of a data story ? **1**

(a) audience (b) visuals

(c) engage (d) information

## Section – B
## (Subjective Type Questions)

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

6. With reference to 'Five Factor Model', mention any four parameters that describe an individual's personality. **2**

7. Define any two of the following personality disorders : **2**
   (a) Avoidant
   (b) Dependent
   (c) Histrionic

8. Differentiate between a row and a cell of a spreadsheet. **2**

9. Write any four qualities that motivate an entrepreneur. **2**

10. Briefly define the term competency. Mention any two Common Entrepreneurial Competencies. **2**

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

11. Mention the names of any four stages of Design Thinking. **2**

12. Explain the term Time series decomposition. **2**

13. Give two points of difference between Cross-Validation and Train-Test Split. **2**

14. Selecting the right analytical approach depends on the questions being asked. **2**

In the light of the above given statement, which type of questions can be asked for (A) Classification approach (B) Descriptive approach

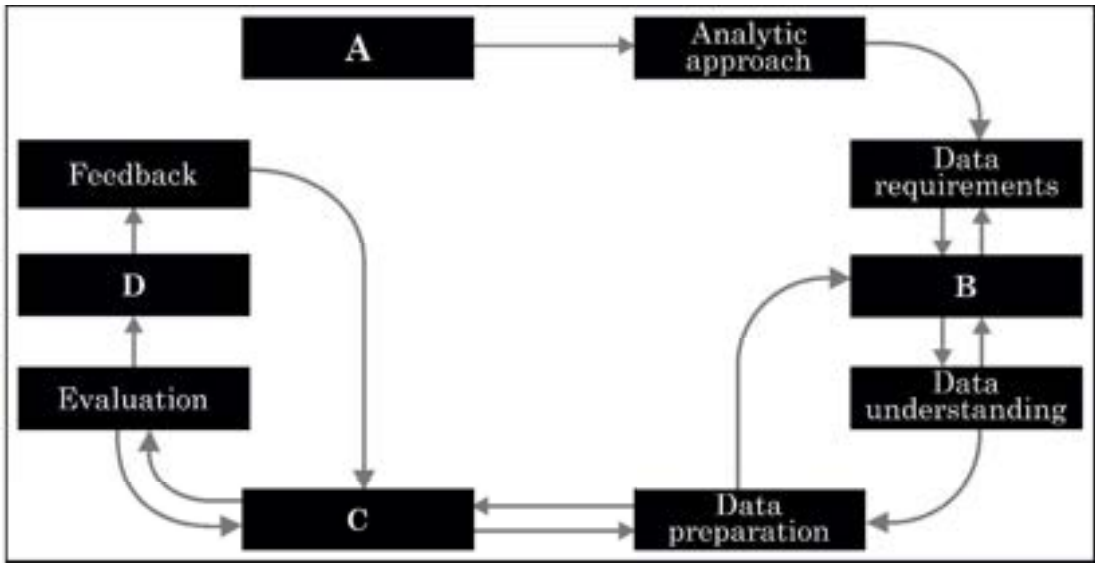
15. Name the main stages of AI project Life cycle. **2**

16. Give two reasons why storytelling is so powerful ? **2**

Answer any **3** out of the given **5** questions in **50-80** words each. **3 × 4 = 12**

17. Give steps to break down a problem into smaller units before coding. **4**

18. The following is the diagram depicting the Foundational methodology for data science. **4**



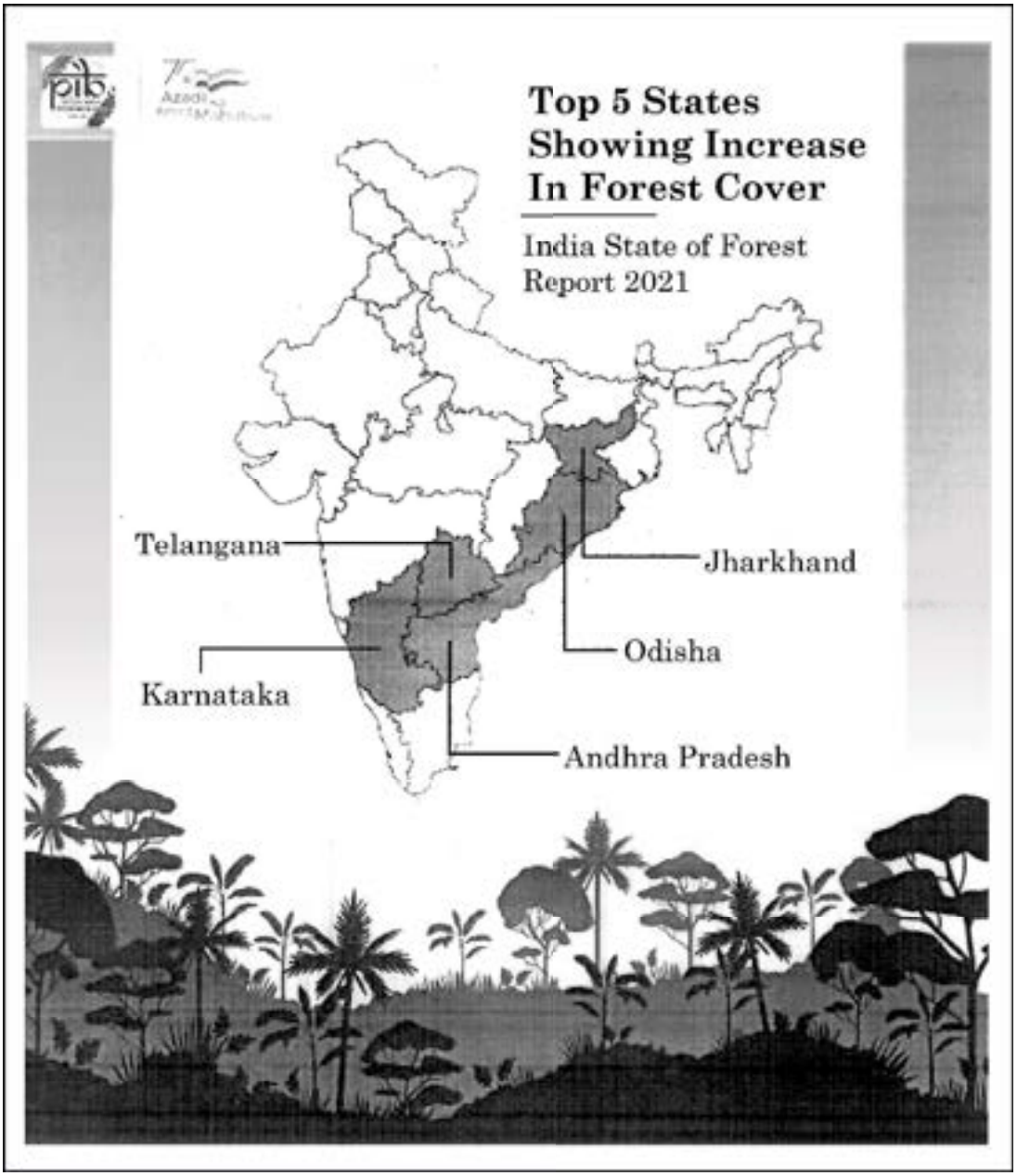

The diagram is marked with A, B, C, D. Identify these four steps and briefly explain the significance of steps marked as 'A' and 'B'.

19. Explain AI project cycle and project scoping in detail. **4**

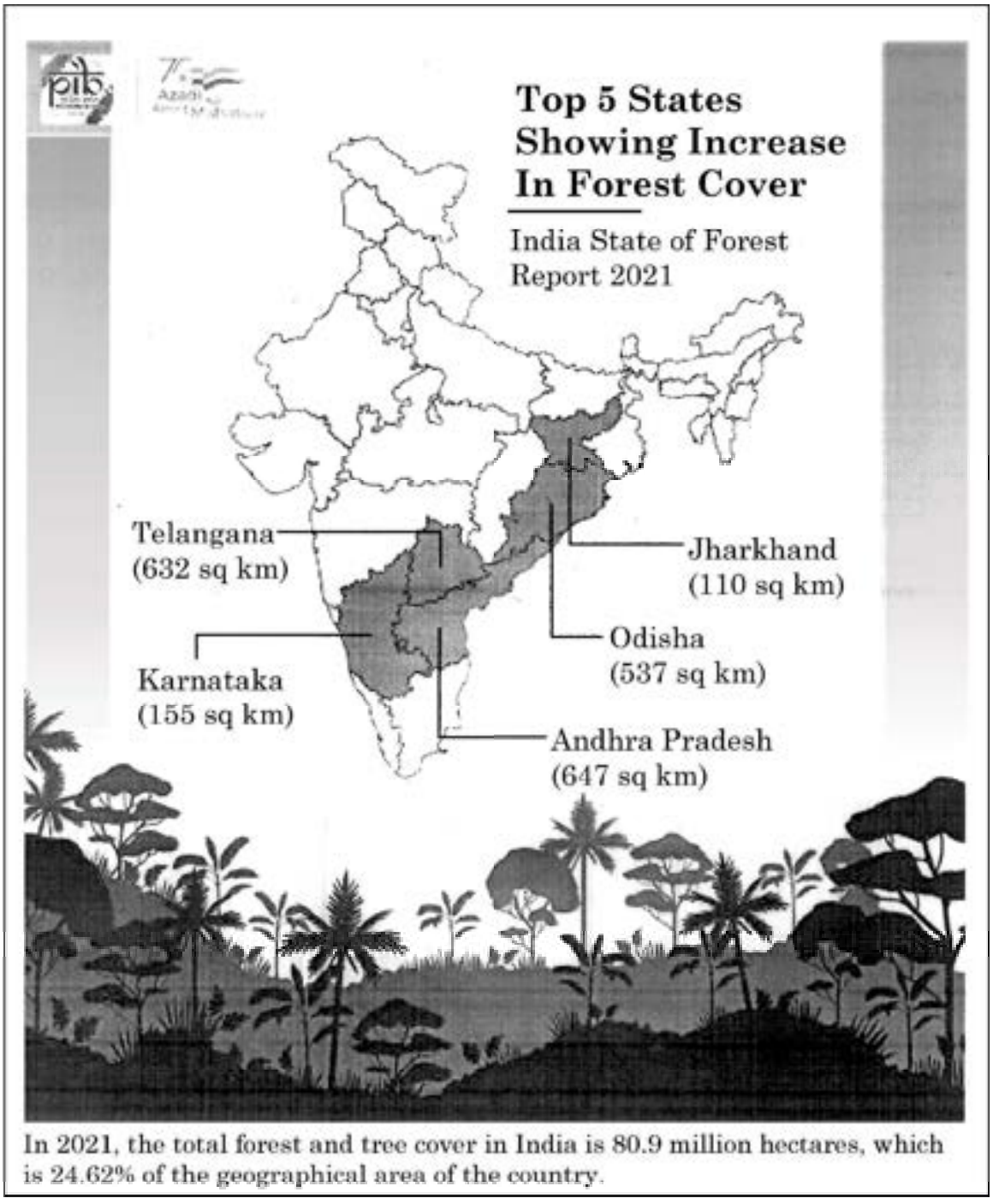
20. (a) Mention the steps that can assist in finding compelling stories in the data sets.

(b) Which of following (Option – A or Option – B) is a better data story ? Give reasons. **4**

**Option – A**



**Option – B**




In 2021, the total forest and tree cover in India is 80.9 million hectares, which is 24.62% of the geographical area of the country.

21. Briefly explain the purpose of Data story telling. Also discuss the significance of each of the key elements in the process of Data story telling. **4**

