

**MODEL TEST PAPER**  
**CLASS XII**  
**ARTIFICIAL INTELLIGENCE (CODE 843)**

**Maximum Time: 2 Hrs.**

**Maximum Marks: 50**

**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 5 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**

**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 source of motivation and inspiration?
  - (a) Music
  - (b) Dreaming big
  - (c) Living in the present
  - (d) Fear(1)
- (ii) Which of the following traits is associated with emotional stability?
  - (a) Calmness
  - (b) Self-confidence
  - (c) Anxiety
  - (c) Cool-headedness(1)
- (iii) view allows you to see exactly how your worksheet will look when printed.
  - (a) Track Changes
  - (b) Zoom feature
  - (c) Print Preview
  - (d) Auto Filter(1)
- (iv) Which of the following is not an organizational skill of an entrepreneur?
  - (a) Managing teams
  - (b) Setting targets
  - (c) Building and motivating a team
  - (d) Creating software programs(1)
- (v) Which of the following is not an entrepreneurial competency?
  - (a) Persistence
  - (b) Commitment
  - (c) Aversion to risk
  - (d) Systematic planning(1)
- (vi) Spreadsheet programs have become very popular because:
  - (a) A Spreadsheet program allows users to create, edit and format documents, ranging from basic text to complex scientific reports.
  - (b) They have built-in functions that make calculations easier, faster and more accurate.
  - (c) They have large volumes of data that can be easily handled and manipulated.
  - (d) Data can be exported to or imported from other similar software applications.(1)

2. Answer any 5 out of the given 6 questions.

(1 x 5 = 5 marks)

- (i) Which of the following depicts the multiplicative decomposition model?  
(a)  $y = \text{trend} + \text{seasonal component} + \text{noise}$   
(b)  $y = \text{trend} * \text{seasonal component} + \text{noise}$   
(c)  $y = \text{trend} * \text{seasonal component} * \text{noise}$   
(d)  $y = \text{trend} * \text{seasonal component} - \text{noise}$  (1)
- (ii) State True or False:  
Values of  $K=3, 5$  and  $10$  are common values in  $K$ -fold cross-validation. (1)
- (iii) ..... is a measure of randomness in the information being processed and ..... is a measure of difference of randomness between two random variables.  
(a) Cross Entropy, Entropy (b) Entropy, Cross Entropy  
(c) Learning Rate, Entropy (d) Entropy, Mean Bias (½ + ½)
- (iv) Which of the following is not an AI development tool?  
(a) Keras (b) TensorFlow  
(c) Scikit-Learn (d) C (1)
- (v) Which map is used to show areas with different shapes in which larger the size, the higher is the severity of the impact?  
(a) Graduated Symbol Maps (b) Dot Map  
(c) Heat Map (d) Dorling Map (1)
- (vi) Data Storytelling uses narrative elements of characters, setting, conflict and .....  
(a) Maps (b) Resolution  
(c) Language (d) Visuals (1)

3. Answer any 5 out of the given 6 questions.

(1 x 5 = 5 marks)

- (i) Mean Bias Error (MBE) takes the average difference between the ..... and the ..... value and not the actual difference.  
(a) Target, Actual (b) Actual, Bias  
(c) Target, Predicted (d) Predicted, Actual (½ + ½)
- (ii) **Assertion (A):** Data stories are more interesting and engaging than looking at data.  
**Reason (R):** Data stories transform a dry collection of facts to something that is more entertaining, thought-provoking and inspirational.  
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 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)
- (iii) State True/False:  
Hyperparameter tuning can be done by methods like Grid Search and Bayesian Optimization. (1)
- (iv) Feature Engineering, Model Training and Model Evaluation are part of .....stage of Data Science Life Cycle.  
(a) Problem Scoping (b) Deployment  
(c) Design (d) Maintenance (1)

- (v) The correct sequence of stages of design thinking is:
- (a) Empathize–Define–Ideate–Prototype–Test
  - (b) Empathize–Define–Prototype–Test–Ideate
  - (c) Ideate–Define–Prototype–Test–Empathize
  - (d) None of these
- (1)

(vi) State True/False:

In K-fold cross-validation procedure, `make_classification()` function can be used to create a synthetic binary classification data set.

(1)

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

(i) is the sum of individual absolute errors divided by demand. It is the average of percentage errors.

(1)

- (a) MAPE
- (b) MSE
- (c) MBE
- (d) RMSE

(ii) Which of the following is a model parameter?

- (a) Coefficients or weights of linear and logistic regression models
  - (b) Weights and biases of a neural network
  - (c) Cluster centroids in clustering
  - (d) All of these
- (1)

(iii) Which of the following is used by stock analysts for getting a high-level overview of market fluctuations?

- (a) Pie Chart
  - (b) Funnel Chart
  - (c) Candlestick Chart
  - (d) Heat Map
- (1)

(iv) State True/False:

For measuring model quality, a simple train-test split is sufficient for smaller data sets while cross-validation is sufficient for larger data sets.

(1)

- (a) Classification, Regression
- (b) Univariate, Bivariate
- (c) Wordclouds, Radial Flow Maps
- (d) Dot Maps, Heat Maps

(v) Which of the following measures the difference between actual outcome and expected outcome of the target variable?

- (a) Bias
  - (b) Precision
  - (c) Mean Absolute Percentage Error
  - (d) None of these
- (1)

(vi) Exploratory Data Analysis (EDA) can be divided into two types of visualization analysis: ..... and .....

- (a) Classification, Regression
  - (b) Univariate, Bivariate
  - (c) Wordclouds, Radial Flow Maps
  - (d) Dot Maps, Heat Maps
- (1)

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

(i) Which of the following is a cross-validation technique?

- (a) K-Fold Cross Validation
  - (b) Holdout Method
  - (c) Both (a) and (b)
  - (d) None of these
- (1)

(ii) Which of the following AI Software incorporates all features like Speech Recognition, Predictive Analysis and Chatbot?

- (a) OpenNN
  - (b) Apache Mahout
  - (c) Scikit-Learn
  - (d) IBM Watson
- (1)

(iii) Which of these is not a parameter in Gradient Descent Algorithm?

- (a) Machine Rate
  - (b) Learning Rate
  - (c) Starting Point
  - (d) Gradient Function
- (1)

- (iv) Hyperparameters are ..... to the model because the model cannot change its values during learning/training. (1)
- (a) External (b) Internal
- (v) State True/False:  
Naive Bayes and Support Vector Machines are examples of Linear Algorithms. (1)
- (vi) In an objective function, the starting point is frequently taken as a ..... number. (1)
- (a) Zero (b) Unique  
(c) Duplicate (d) Random

### 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.**

6. What do you understand by internal or external motivation? (2)
7. Write four factors that can influence a person's personality. (2)
8. What do you mean by filtering data and sorting data in a spreadsheet? (2)
9. Write four barriers to becoming an entrepreneur. (2)
10. How do persistence and assertiveness play a key role in the success of an entrepreneur and in achievement of entrepreneurial goals? (2)

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

11. With the help of a suitable example, explain a confusion matrix. (2)
12. How do you configure a Train-Test Split? Give an example of a common split percentage. (2)
13. What are the different components of time series data? (2)
14. List few performance metrics of model quality. Explain any one in brief. (2)
15. Suggest few practices of storytelling which can result in better data representation. (2)
16. What are some key steps in the Problem Scoping stage of AI Project Life Cycle? (2)

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

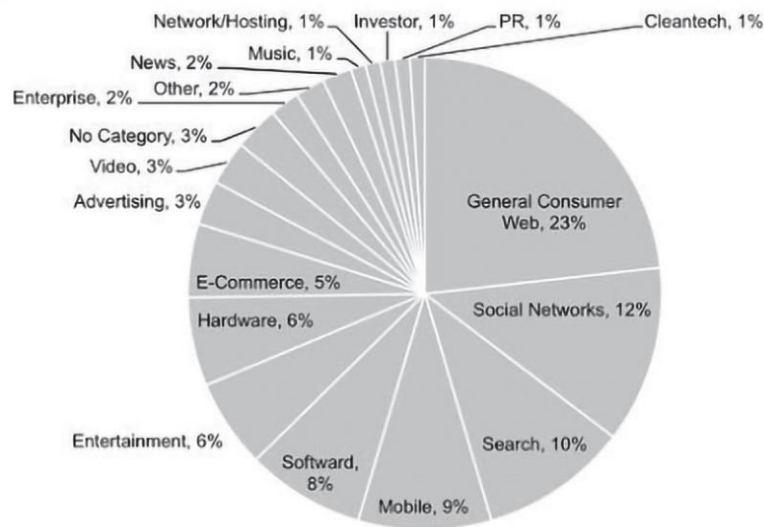
17. Explain K-Fold Cross Validation. How is the value of K decided? What are the most common values of K?(4)
18. Calculate MAPE for the following data:

Month	Forecasted Sales	Actual Sales
Jan	20	25
Feb	25	30
March	35	32
April	38	32
May	42	38
June	40	42

19. Explain AI Model Project Cycle in detail. Explain any two hyperparameter tuning methods. (4)
20. Taking an example of any data set, explain the steps involved in creating a model and suggest ways to create stories from it. (4)

21. Which data story about the coverage domain of a leading technology blog given below is better and why?

(a) Pie Chart(4)



(b) Bar Chart

