CBSE | DEPARTMENT OF SKILL EDUCATION

ARTIFICIAL INTELLIGENCE (SUBJECT CODE 843)

MARKING SCHEME FOR CLASS XII (SESSION 2023-2024)

Max. Time: 2 Hours   **Max. 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 05 questions.
     ii. There is no negative marking.
     iii. Do as per the instructions given.
     iv. Marks allotted are mentioned against each question/part.
7. **SECTION B – SUBJECTIVE TYPE QUESTIONS (26 MARKS):**
     i. This section contains 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. No.	QUESTION	Source Material (NCERT/, PSSCIVE/ CBSE Study Material)	Unit/ Chap. No.	Page no. of source material	Marks
Q. 1	**Answer any 4 out of the given 6 questions on Employability Skills (1 x 4 = 4 marks)**				
i.	c. To whom?	NCERT	1	17	1
ii.	a. Intrinsic motivation	NCERT	2	24	1
iii.	a. Both Statement1 and Statement2 are correct	NCERT	2	33	1
iv.	b. A → 3; B → 1; C → 2	NCERT	3	55	1
v.	b. Perseverance	NCERT	4	103	1
vi	c. Dispose-off the e-waste with the help of a certified partner	NCERT	5	120	1

Q. 2	**Answer any 5 out of the given 6 questions (1 x 5 = 5 marks)**				
i.	(b) Test	CBSE Study Material	1	5	1
ii.	(c) Understanding the audience	CBSE Study Material	3	35	1
iii.	(a) 1=D, 2=B, 3=E, 4=A, 5=C	CBSE Study Material	1	5	1
iv.	(d) 1 & 4	CBSE Study Material	2	33	1
v.	(b) MSE can here be used as the loss function.	CBSE Study Material	1	29	1
vi.	(d) iterative	CBSE Study Material	2	33	1

Q. 3	**Answer any 5 out of the given 6 questions (1 x 5 = 5 marks)**				
i.	(c) Data Understanding	CBSE Study Material	1	12	**1**
ii.	(d) engaging	CBSE Study Material	3	35	**1**
iii.	(b) Scoping	CBSE Study Material	2	33	**1**
iv.	b. Both A and R are true and R is not the correct explanation of A	CBSE Study Material	3	35	**1**
v.	(c) Lower RMSE values are not good for the AI model.	CBSE Study Material	1	28	**1**
vi.	(c) deploy	CBSE Study Material	2	32	**1**
Q. 4	**Answer any 5 out of the given 6 questions (1 x 5 = 5 marks)**				
i.	(d) Testing	CBSE Study Material	2	34	**1**
ii.	(a) Narrative (b) Data	CBSE Study Material	3	39	**1**
iii.	(c) As we need to train on many training sets, cross-validation is computationally expensive.	CBSE Study Material	**1**	**21**	**1**
iv.	True	CBSE Study Material	3	38	**1**
v.	(d) 3-1-2-4	CBSE Study Material	2	33	**1**
vi.	(a)Regression functions predict a quantity, and classification functions predict a label.	CBSE Study Material	1	23	**1**
Q. 5	**Answer any 5 out of the given 6 questions (1 x 5 = 5 marks)**				
i.	(d) facts	CBSE Study Material	3	35	**1**
ii.	(a) RMSE	CBSE Study Material	1	28	**1**
iii.	(b) 1) and 2) only	CBSE Study Material	2	34	**1**
iv.	(c) Weather forecast	CBSE Study Material	1	13	**1**
v.	d. (1), (2) and (4)	CBSE Study Material	2	34	**1**
vi.	c) pattern	CBSE Study Material	1	4	**1**

SECTION B: SUBJECTIVE TYPE QUESTIONS

Q. No.	QUESTION	Source Material (NCERT/PSSCIVE/ CBSE Study Material)	Unit/ Chap. No.	Page no. of source material	Marks
Answer any 3 out of the given 5 questions on Employability Skills in 20 – 30 words each (2 x 3 = 6 marks)					
Q. 6	P in Respect stands for - Pay attention and focus on what the speaker is saying. (1 mark for the word 'Pay'; and 1 mark for explanation)	NCERT	1	5	**2**
Q. 7	Steps to overcome personality disorders • Talk to someone. Most often, it helps to share your feelings. • Look after your physical health. A healthy body can help you maintain a healthy mind. • Build confidence in your ability to handle difficult situations. • Engage in hobbies, such as music, dance and painting. These have a therapeutic effect. • Stay positive by choosing words like 'challenges' instead of 'problems'. (Any 2 of the above – 1 mark each)	NCERT	2	37	**2**

Q. 8	A worksheet is a collection of cells in the form of a grid (a network of lines that intersect each other, making rectangles). When you open a spreadsheet for the first time, you see a blank worksheet with the name 'Sheet1'. A workbook is a spreadsheet that has one or more worksheets. (1 mark each)	NCERT	3	42	**2**
Q. 9	• Government Mudra Yojana • Credit Guarantee Scheme • Stand-Up India Scheme (Any 2 ; 1 mark each)	NCERT	4	92	**2**
Q. 10	• increase the efficiency of energy and raw material. • reduce greenhouse gas emissions. • control waste and pollution. • protect and restore ecosystems. • support adaptation to the effects of climate change. (Any 2 ; 1 mark each)	NCERT	5	114	**2**

Answer any 4 out of the given 6 questions in 20 – 30 words each (2 x 4 = 8 marks)					
Q. 11	A capstone project is a project where students must research a topic independently to find a deep understanding of the subject matter. It gives an opportunity for the student to integrate all their knowledge and demonstrate it through a comprehensive project**.**	**CBSE Study Material**	1	3	**2**
Q. 12	The MSE value cannot be negative. The difference between projected and actual values are always squared. As a result, all outcomes are either positive or negative.	**CBSE Study Material**	1	28	**2**
Q. 13	Stories are more likely to drive action than are statistics and numbers. Therefore, when told in the form of a narrative, it reduces ambiguity, connects data with context, and describes a specific interpretation – communicating the important messages in most effective ways.	**CBSE Study Material**	3	35	**2**
Q. 14	To decompose this task, you would need to know the answer to a series of smaller problems: • what kind of app you want to create? • what will your app will look like? • who is the target audience for your app? • what will the graphics will look like? • what audio will you include?	**CBSE Study Material**	1	6	**2**
Q. 15	A training set is a set of historical data in which the outcomes are already known. Train Dataset: Used to fit the machine learning model. Test Dataset: Used to evaluate the fit machine learningmodel.	**CBSE Study Material**	1	14	**2**
Q. 16	The Design phase is essentially an iterative process comprising all the steps relevant to building the AI or machine learning model: data acquisition, exploration, preparation, cleaning, feature engineering, testing and running a set of models to try to predict behaviors or discover insights in the data.	**CBSE Study Material**	2	33	**2**

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

Q. 17	Data storytelling is a structured approach for communicating insights drawn from data, and invariably involves a combination of three key elements: *data*, *visuals*, and *narrative*. When the narrative is accompanied with data, it helps to *explain* the audience what's happening in the data and why a particular insight has been generated. When visuals are applied to data, they can *enlighten* the audience to the insights that they wouldn't perceive without the charts or graphs. Finally, when narrative and visuals are merged together, they can *engage* or even entertain an audience. When you combine the right visuals and narrative with the right data, you have a data story that can influence and drive *change*. 	**CBSE Study Material**	3	37	4

Q. 18	x y (observed) y' (predicted) Residual (predicted-observed) Squared Residuals	**CBSE Study Material**	1	24	4

x	y (observed)	y' (predicted)	Residual (predicted-observed)	Squared Residuals
44	47	48.6	1.6	2.56
46	48	50	2	4
48	55	51.4	-3.6	12.96
50	58	52.8	-5.2	27.04
52	49	54.2	5.2	27.04
			RMSE	**3.836**

Q. 19	Considerations: • The volume of test data can be large, which presents complexities. • Human biases in selecting test data can adversely impact the testing phase, therefore, data validation is important. • Your testing team should test the AI and ML algorithms keeping model validation, successful learnability, and algorithm effectiveness in mind. Regulatory compliance testing and security testing are important since the system might dealwith sensitive data, moreover, the large volume of data makes performance testing crucial.	**CBSE Study Material**	2	34	4

| Q. 20 | In cross-validation, we run our modeling process on different subsets of the data to get multiple measures of model quality.
In k-fold cross-validation, the original dataset is equally divided into k subparts or folds. Out of the k-folds, for each iteration, one group is selected as test data, and the remaining (k-1) groups are selected as training data. This process is repeated for k times. The final accuracy of the model is calculated by taking the mean accuracy.

When the dataset is smaller, cross-validation procedure should be selected for higher accuracy. | **CBSE Study Material** | 1 | 20 | 4 |
| Q. 21 | (a) The steps involved in telling an effective datastory are given below:
• Understanding the audience
• Choosing the right data and visualisations
• Drawing attention to key information
• Developing a narrative
• Engaging your audience

(b) **Option A** is a better data story.
Reasons
1. The insight given at the bottom of the visual is giving a clear idea about context which is not therein Option B.
Option A visual provides a compellingnarrative. | **CBSE Study Material** | 3 | 35 | 4 |