CBSE | DEPARTMENT OF SKILL EDUCATION

ARTIFICIAL INTELLIGENCE (SUBJECT CODE -843)

Blue-print for Sample Question Paper for Class XII (Session 2022-2023)

Max. Time: 2 Hours   **Max. Marks: 50**

PART A - EMPLOYABILITY SKILLS (10 MARKS):

UNIT NO.	NAME OF THE UNIT	OBJECTIVE TYPE QUESTIONS	SHORT ANSWER TYPE QUESTIONS	TOTAL QUESTIONS
		1 MARK EACH	2 MARKS EACH	
1	Communication Skills - IV	-	-	-
2	Self-Management Skills - IV	2	2	4
3	ICT Skills - IV	2	1	3
4	Entrepreneurial Skills - IV	2	2	4
5	Green Skills - IV	-	-	-
	TOTAL QUESTIONS	**6**	**5**	**11**
	NO. OF QUESTIONS TO BE ANSWERED	**Any 4**	**Any 3**	**07**
	TOTAL MARKS	**1 x 4 = 4**	**2 x 3 = 6**	**10 MARKS**

PART B - SUBJECT SPECIFIC SKILLS (40 MARKS):

UNIT NO.	NAME OF THE UNIT	OBJECTIVE TYPE QUESTIONS	SHORT ANSWER TYPE QUESTIONS	DESCRIPTIVE/ LONG ANS. TYPE QUESTIONS	TOTAL QUESTIONS
		1 MARK EACH	2 MARKS EACH	4 MARKS EACH	
1	Capstone Project	10	4	2	16
2	Model Life Cycle	8	1	1	10
3	Story Telling through Data	6	1	2	8
	TOTAL QUESTIONS	**24**	**6**	**5**	**34**
	NO. OF QUESTIONS TO BE ANSWERED	**20**	**Any 4**	**Any 3**	**27**
	TOTAL MARKS	**1 x 20 = 20**	**2 x 4 = 8**	**4 x 3 = 12**	**40 MARKS**

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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.   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.	Self-motivation is important because i. It increases individual's energy and activity. ii. It directs an individual towards specific goals. iii. It results in initiation and persistence of specific activities iv. It affects cognitive processes and learning strategies used for completing similar tasks. a). Only i b). Both i and ii c). i, iii and iv d). All of the above	**1**
ii.	For an entrepreneur, aversion to risk is: a) A failure b) An opportunity c) A psychological barrier An initiative	**1**
iii.	_____ is the command to select the entire worksheet: a) CTRL + O b) CTRL + A c) CTRL + C d) CTRL + Z	**1**
iv.	Which of the following factors influence personality? e) Genes f) Environmental setting g) Culture h) All of the above	**1**
v.	A competent person is i) Self-confident j) Emotional k) Dependent l) Lazy	**1**
vi.	Which software helps in performing calculations using formulae and in analyzing the data? a) Microsoft Outlook b) Comm Central c) Range OpenOffice Calc	**1**

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

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

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

iii.	Match the following
	
	   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
		1

iv.	Identify two AI development tools from the following:
	   1) DataRobot 2) Python
	   3) Scikit Learn 4) Watson Studio
	   (a) 1 & 2 (b) 2 & 3 (c) 1 & 3 (d) 1 & 4
		1

v.	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? (a) RMSE (b) MSE (c) Exponential error (d) MAE	1
vi.	The design phase of the AI Model Life Cycle is an _____ process. (a) compact (b) permanent (c) periodic (d) iterative	1

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

i.	Techniques like descriptive statistics and visualisations can be applied to datasets after the original data gathering to analyse the content. To close the gap, additional data collecting may be required. Identify the stage of this analytic approach.
	   (a) Data Requirements
	   (b) Data Gathering
	   (c) Data Understanding
	   (d) Data Preparation
		1

ii.	Stories create _____ experiences that transport the audience to another space and time. (a) unpleasant (b) tedious (c) repetitive (d) engaging	1

iii.	In this phase, we define the project's strategic business objectives and desired outcomes, align all stakeholders' expectations as well as establish success metrics. Identify this phase of the AI Model Life Cycle. (a) Design (b) Scoping (c) Evaluation (d) Data Collection	1
iv.	**Assertion (A):** Stories that combine statistics and analytics are more persuasive. **Reason (R):** When we talk about data storytelling, we're talking about stories in which data plays a central role. 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	1
v.	Which of the following is **not** a feature of RMSE? (a) It tells about the accuracy of the model. (b) Higher value means hyper parameters need to be tweaked (c) Lower RMSE values are not good for the AI model. (d) RMSE is a measure of how evenly distributed residual errors are.	1
vi.	Once you have got an AI model that's ready for production, AI engineers then _____ a trained model, making it available for external inference requests. (a) Evaluate (b) Test (c) Deploy (d) Redesign	1

Q. 4	**Answer any 5 out of the given 6 questions (1 x 5 = 5 marks)**	
i.	Data Validation for human biases is conducted in _____ phase of AI Model Life Cycle. (a) Scoping (b) Data Collection (c) Design (d) Testing	1
ii.	Identify the following icons: (a) (b)	1
iii.	Which of the following is a **disadvantage** of Cross Validation Technique? (a) Cross-validation provides insight into how the model will generalise to a new dataset. (b) Cross-validation aids in determining a more accurate model prediction performance estimate. (c) As we need to train on many training sets, cross-validation is computationally expensive. (d) Cross-validation could result in more precise models.	1
iv.	Hyper parameters are parameters whose values govern the learning process. (a) True (b) False	1

v.	The steps that assist in finding compelling stories in the data sets are as follows. Arrange them in proper order: 　1)　Visualize the data. 　2)　Examine data relationships. 　3)　Get the data and organise it. 　4)　Create a simple narrative embedded with conflict. 　(a) 1-2-3-4　　　　　　　　　(b) 2-3-1-4 　(c) 4-1-3-2　　　　　　　　(d) 3-1-2-4		**1**
vi.	Choose the difference between Regression and Classification Loss functions from the following: 　(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.		**1**

Q. 5	**Answer any 5 out of the given 6 questions (1 x 5 = 5 marks)**	
i.	Stories change the way that we interact with data, transforming it from a dry collection of _____ to something that can be entertaining, thought provoking, and inspiring change. 　(a) visuals　　(b) points　　(c) images　　(d) facts	**1**
ii.	A good model should have an _____ value less than 180. 　(a) RMSE　　　　　　　　　(b) MSE 　(c) Focal Loss　　　　　　　(d) MAE	**1**
iii.	Which of the following is **incorrect**? 　　1)　　Testing data is the one on which we train and fit our model basically to fit the parameters 　　2) Training data is used only to assess performance of model 　　3) Testing data is the unseen data for which predictions have to be made 　a)　1) and 3) only 　b)　1) and 2) only 　c)　2) and 3) only 　d)　1), 2) and 3)	**1**
iv.	Choose an example of an AI predictive model. 　(a) YouTube　　　　　　　(b) Spam detection 　(c) weather forecast　　　(d) Sentiment Analysis	**1**
v.	Which of the following are the objectives of the testing team in AI modelling? 　1)　Model Validation 　2)　Security compliance 　3)　Understanding data 　4)　Minimizing bias 　a. (1), (2) and (3)　　　　　　　b. (2), (3) and (4) 　c. (1), (3) and (4)　　　　　　　d. (1), (2) and (4)	**1**

vi.	If AI techniques are to be applied to a dataset, the data must have a _____. a. association b. relationship c. pattern d. Either a and b	1

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	Why is self-management important? Give one example.	2
Q. 7	Define any two of the following personality disorders a. Paranoid b. Anti-social c. Obsessive Compulsive	2
Q. 8	Mention two steps in which we can save a workbook.	2
Q. 9	What are entrepreneurial skills?	2
Q. 10	Name two qualities of a person with entrepreneurial skills. Explain in a sentence each.	2

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

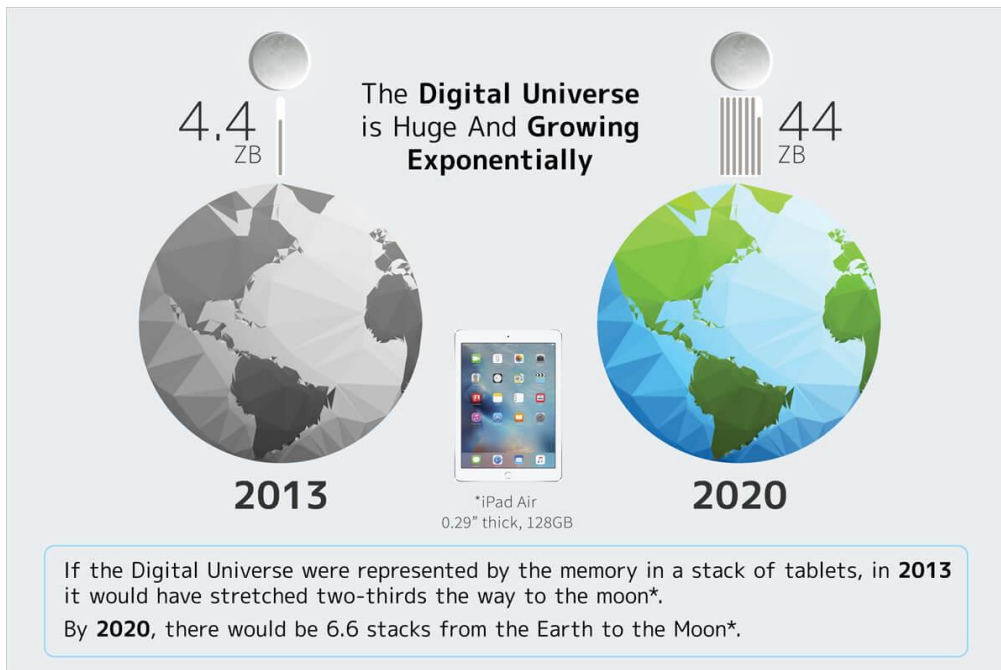| Q. 11	Define capstone project.	2
Q. 12	Can MSE be a negative value? Give reasons.	2
Q. 13	What is the importance of a narrative in a story?	2
Q. 14	Imagine that you want to create your first app. Create a list of questions you would develop to decompose this task.	2
Q. 15	Differentiate between training set and test set.	2
Q. 16	"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

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

Q. 17	Explain how data storytelling can bring about change using a diagram.	4

Q. 18	Consider the following data
	     x y
	   44 47
	   46 48
	   48 55
	   50 58
	   52 49
	 Regression Equation: 0.7x + 17.8
	
	 Calculate the RMSE(Root means Square Error) for the above data.
		4

Q. 19	List the considerations which data scientists have to keep in mind during the testing stage.	4

Q. 20	Explain the Cross Validation Procedure? In which situation is it better than a Train Test Split?	4
Q. 21	(a) List the steps of creating an effective data story. (b) Which of the following is a better data story? Give reasons. Option A: (Source: https://www.crazyegg.com/blog/data-storytelling-5-steps-charts/) Option B: 	4