CBSE | DEPARTMENT OF SKILL EDUCATION

DATA SCIENCE (SUBJECT CODE - 419)

MARKING SCHEME FOR CLASS X (SESSION 2024-2025)

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.	b) 93%	NCERT	1	11	**1**
ii.	c) Adaptability	NCERT	2	40	**1**
iii.	Time Management	NCERT	2	59	**1**
iv.	d) Windows key	NCERT	3	67	**1**
v.	c) patient	NCERT	4	93	**1**
vi.	a) Both Statement1 and Statement2 are correct	NCERT	5	104	**1**
Q. 2	**Answer any 5 out of the given 6 questions (1 x 5 = 5 marks)**				
i.	a) Mean	CBSE Study Material	1	6	**1**
ii.	b) discrete, continuous	CBSE Study Material	2	21	**1**
iii.	a) mean and standard deviation	CBSE Study Material	3	35	**1**
iv.	Data Merging	CBSE Study Material	4	42	**1**
v.	b) Data Governance Framework	CBSE Study Material	5	56	**1**
vi.	c) Both a) and b)	CBSE Study Material	5	57	**1**
Q. 3	**Answer any 5 out of the given 6 questions (1 x 5 = 5 marks)**				
i.	b) Subset	CBSE Study Material	1	2	**1**
ii.	Distribution	CBSE Study Material	2	19	**1**
iii.	c) (i)-(B), (ii)-(D),(iii)-(A), (iv)-(C)	CBSE Study Material	3	33	**1**
iv.	a) $(x-\mu)/\sigma$	CBSE Study Material	4	44	**1**
v.	d) iii and iv	CBSE Study Material	4	44	**1**

vi.	d) Crumbling the papers which contain confidential data and throwing it in the dustbin	CBSE Study Material	5	60	**1**
Q. 4	**Answer any 5 out of the given 6 questions (1 x 5 = 5 marks)**				
i.	a) Both Statement1 and Statement2 are correct	CBSE Study Material	1	9	**1**
ii.	a) 4/52	CBSE Study Material	2	27	**1**
iii.	c) i, ii and iii	CBSE Study Material	3	32	**1**
iv.	b) Four	CBSE Study Material	4	46	**1**
v.	a) 1 and 0	CBSE Study Material	4	44	**1**
vi.	b) One can easily restore it	CBSE Study Material	5	57	**1**
Q. 5	**Answer any 5 out of the given 6 questions (1 x 5 = 5 marks)**				
i.	82	CBSE Study Material	1	7	**1**
ii.	a) Probability	CBSE Study Material	2	27	**1**
iii.	c)Statement1 is correct but Statement2 is incorrect	CBSE Study Material	3	34	**1**
iv.	b) Deciles	CBSE Study Material	4	47	**1**
v.	c) Both are true	CBSE Study Material	4	44	**1**
vi.	a) Both A and R are correct and R is the correct explanation of A	CBSE Study Material	5	57	**1**

SECTION B: SUBJECTIVE TYPE QUESTIONS

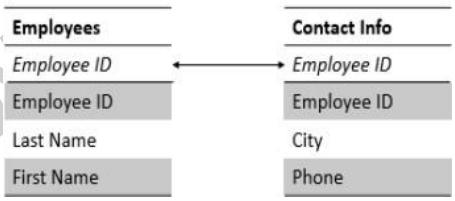
Q. No.	**QUESTION**	**Source Material** (NCERT/ PSSCIVE/ CBSE Study Material)	**Unit/ Chap. No.**	**Page no. of source material**	**Marks**
Answer any 3 out of the given 5 questions on Employability Skills in 20 – 30 words each (2 x 3 = 6 marks)					
Q. 6	**It validates effective listening**: The person providing the feedback knows they have been understood (or received) and that their feedback provides some value. **It motivates**: Feedback can motivate people to build better work relationships and continue the good work that is being appreciated. **It is always there**: Every time you speak to a person, we communicate feedback so it is impossible not to provide one. **It boosts learning**: Feedback is important to remain focussed on goals, plan better and develop improved products and services. **It improves performance**: Feedback can help to form better decisions to improve and increase performance (Any two points with explanation; ½ mark for each point; ½ mark for explanation of each point)	NCERT	1	18	**2**
Q. 7	'R' stands for Realistic. A realistic goal would be something that we want to achieve and can work towards. For example, "I spend 3 hours every day of the year after school to revise my subjects to get good marks in the exams." (1 mark for writing the word realistic; 1 mark for explanation)	NCERT	2	56	**2**

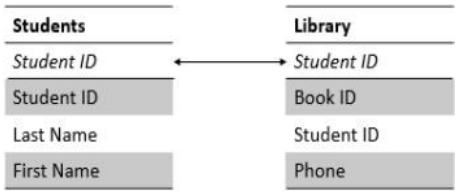
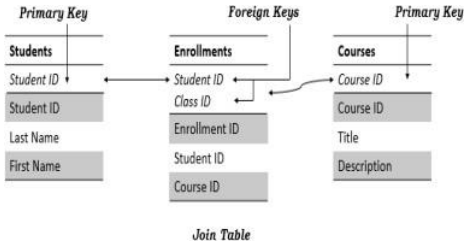
Q. 8	If we leave the device plugged in for a long time, • it can overheat the battery • it reduces the battery life. (1 mark for each point)	NCERT	3	75	**2**
Q. 9	In wage-employment, an employee works for a person or an organization and get paid for that work. In self-employment, an individual starts business to satisfy the needs of people. A self-employed person who is always trying to make his/her business better by taking risks and trying new ideas is an entrepreneur. (1 mark for explanation of wage-employment; 1 mark for explanation of self- employment)	NCERT	4	85	**2**
Q. 10	Organic farming is where farmers do not use chemical pesticides and fertilisers to increase their production. They use organic and natural fertilisers, such as cow dung to help in growing crops. (1 mark per point)	NCERT	5	107	**2**

Answer any 4 out of the given 6 questions in 20 – 30 words each (2 x 4 = 8 marks)					
Q. 11	<table><tr><th>People</th><th>Like Pizza</th><th>Like Burger</th><th>Total</th></tr><tr><td>Kids</td><td>7</td><td>3</td><td>10</td></tr><tr><td>Adults</td><td>5</td><td>5</td><td>10</td></tr><tr><td>Total</td><td>12</td><td>8</td><td>20</td></tr></table> (½ mark each for writing the numbers under the heading like pizza and like burger for kids and adults in a tabular format)	CBSE Study Material	1	4, 5	**2**
Q. 12	Every probability distribution is associated with a graph that describes the likelihood of the occurrence of each event. This type of distribution is called a Uniform Distribution. Example: Rolling a Dice, Tossing a coin, etc., (1 mark for explanation; 1 mark for example)	CBSE Study Material	2	20	**2**
Q. 13	The survivorship bias is based on the concept that we usually tend to twist the data sets by focusing on successful examples and ignoring the failures. This type of bias also occurs when we are looking at the competitors. Example: A hospital is conducting research on trauma patients admitted to the ER, seeking to find out which procedures work best. However, researchers can only begin their studies if a patient is stable enough to give consent. (1 mark for explanation; 1 mark for example)	CBSE Study Material	3	33	**2**
Q. 14	It is very helpful to standardize the values of a normal distribution by converting them into z-score because: 1. It gives us an opportunity to calculate the probability of a value occurring within a normal distribution. 2. Z-score allows us to compare two values that are from different samples. (1 mark for each point)	CBSE Study Material	4	46	**2**
Q. 15	Sort in Ascending order • 14 22 27 32 34 35 44 • 22 comes in 2nd place • Percentile= (1/7) *100	CBSE Study Material	4	46	**2**

	• =14 percentile (½ mark per step)				
Q. 16	We can safely discard the data in one of the following ways. • Shredding the Documents • Burning the Documents • Cutting up the Documents (Any two; 1 mark for each)	CBSE Study Material	5	15	**2**

Answer any 3 out of the given 5 questions in 50– 80 words each (4 x 3 = 12 marks)					
Q. 17	For data analysis, we do not need the entire data for consideration. Therefore, instead of working with the whole data set, we can take a certain part of the data for our analysis. This division of a small set of data from a large set of data is known as a Subset. Different ways of subsetting data are: **Row-based subset**: some rows from the top or bottom of the table are taken into consideration for Row-based subsetting. **Column-based subset**: specific columns from the dataset are taken into consideration for column-based subsetting. **Data-specific subset**: Only specific data is taken into consideration for Data specific subset. (1 mark for explaining subset; 1 mark each for three ways of subsetting)	CBSE Study Material	1	3,4	**4**
Q. 18	The purpose of the Statistical Problem Solving Process is to collect and analyze data to answer the statistical investigative questions. This investigative process involves four components, each of which involves exploring and addressing variability: 1. Formulate Statistical Investigative Questions 2. Collect/Consider the Data 3. Analyze the Data 4. Interpret the Data Consider that there is an annual event in your school for which you all are planning to shortlist a musical group for school. • To start with, we can start collecting data for each class. Now that we have all the data with us, each class can compare preferences of their class with the preferences of other classes of the school and explore the following statistical question: *What type of music do the students at our school like?* • Next, we can pose a series of survey questions that allow us to explore in more depth the types of music students like. After collecting all the data, we can look at whether an association appears to be likely between different types of music students like. • Then we can analyze the survey data collected using a class as a sample for the school, and we can plot a graph of the number of students who like each type of music.	CBSE Study Material	2	21	**4**

	• The analysis in graphical form will help us to identify the popular type of music that can be used for the annual event. (2 marks for explanation; 2 marks for example)				
Q. 19	The Central Limit Theorem states that distribution of sample approaches a normal distribution as the sample size gets larger irrespective of what is the shape of the population distribution. The Central Limit Theorem is a statistical theory stating that given a significantly large sample size from a population with finite variance, the mean of all samples from the same set of populations will be roughly equal to the mean of the population. For example, In India, the recorded weights of the male population are following a normal distribution. The mean and the standard deviations are 68 kgs and 10 kgs, respectively. If a person is eager to find the record of 50 males in the population, then what would mean and the standard deviation of the chosen sample? Over here, Mean of the Population – 68 kgs Population Standard Deviation (σ) – 10 kgs Sample size (n) – 50 Mean of Sample is the same as the mean of population. The mean of the population is 68 since the sample size > 30. Sample Standard Deviation is calculated using below formula: $\sigma_x = \frac{\sigma}{\sqrt{n}}$ Thus, Sample Standard Deviation = $\frac{10}{\sqrt{50}}$ [optional]Sample Standard Deviation is 1.41. (2 marks for explanation of central limit theorem; 2 marks for example; calculation of standard deviation can be ignored)	CBSE Study Material	3	30 - 36	**4**
Q. 20	We can perform data merging by implementing data joins on the databases in frame. There are **three** categories of data joins: One to One Joins: One to one join is probably one of the simplest join techniques. In this type of join, each row in one table is linked to a single row in another table using a "key" column.  **One to Many Joins** In a one to many join, one record in a table can be related to one or many records in another table.	CBSE Study Material	4	42-44	**4**

	 **Many to Many Joins** A many to many relationships is said to occur when multiple records in one table are related to multiple records of other table.  (1 mark for number of joins; 1 mark each for explanation of each type of join)				
Q. 21	**1. Protect Your Customer** Privacy does not always mean confidentiality because private data may need to be audited based on the relevant requirements. However, the private data acquired from a person with their consent should never be exposed for use by different businesses or individuals. **2. The private information that is shared should always be handled with confidentiality** Third-party companies share sensitive data, either financial, location related, or medical. They should always have restrictions on if and how that information is allowed to be passed forward. **3. Customers should always have a clear view** of how their data is getting used or traded and should have the authority to manage the flow of their confidential information across enormous, thirdparty systems. **4. Data should never interfere with human will** Data analytics can average out and at times, even discover who we are even before we make up our mind. Organizations should begin thinking about the different type of predictions and conclusions that can be allowed and the ones that cannot. **5. Data should never institutionalize unfair biases** like sexism or racism. Analytical systems can absorb unconscious biases in a crowd and boost them with the help of training samples. (any four of the given points; 1 mark per point)	CBSE Study Material	5	56	**4**