CBSE | DEPARTMENT OF SKILL EDUCATION
DATA SCIENCE (SUBJECT CODE - 419)

MARKING SCHEME FOR CLASS X (SESSION 2026-2027)

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) Channel	NCERT-EMPLOYABILITY SKILL	1	4	**1**
ii.	c) Consequence	NCERT-EMPLOYABILITY SKILL	2	41	**1**
iii.	c) Time-bound	NCERT-EMPLOYABILITY SKILL	2	56	**1**
iv.	c) Ctrl + Z (Undo)	NCERT-EMPLOYABILITY SKILL	3	73	**1**
v.	b) Decision-making	NCERT-EMPLOYABILITY SKILL	4	93	**1**
vi.	b) Responsible Consumption and Production	NCERT-EMPLOYABILITY SKILL	5	112	**1**
Q.2	**Answer any 5 out of the given 6 questions (1 x 5 = 5 marks)**				
i.	b) The average of squared differences from the mean	CBSE Study Material	1	8	**1**
ii.	b) How probable values for a variable occur and how often	CBSE Study Material	2	16	**1**

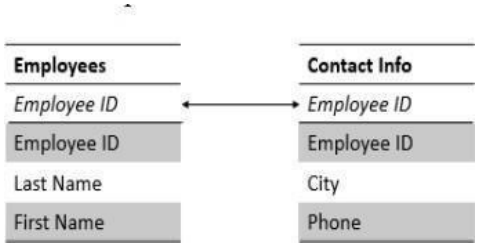
iii.	a) Bias	CBSE Study Material	3	27	**1**
iv.	"key"	CBSE Study Material	4	37	**1**
v.	b) To ensure proper handling, security, and usage of data	CBSE Study Material	5	49	**1**
vi.	a) Informed consent	CBSE Study Material	5	49	**1**
Q.3	**Answer any 5 out of the given 6 questions (1 x 5 = 5 marks)**				
i.	b) Percentages	CBSE Study Material	1	5	**1**
ii.	b) Continuous	CBSE Study Material	2	18	**1**
iii.	b) (i)-(D), (ii)-(C), (iii)-(B), (iv)-(A)	CBSE Study Material	3	28	**1**
iv.	a) It is the number of standard deviations a particular score lies above or below the mean of the set of scores.	CBSE Study Material	4	39	**1**
v.	d) iii and iv	CBSE Study Material	4	44	**1**
vi.	c) A is true, but R is false	CBSE Study Material	5	49	**1**
Q.4	**Answer any 5 out of the given 6 questions (1 x 5 = 5 marks)**				
i.	b) Column-based Subsetting	CBSE Study Material	1	2	**1**
ii.	b) Collect and analyze data to answer questions	CBSE Study Material	2	18	**1**
iii.	c) p percent of the observations fall at or below it	CBSE Study Material	3	45	**1**
iv.	a) i * (n + 1)/10^{th} Data	CBSE Study Material	4	43	**1**
v.	b) To protect sensitive information from misuse	CBSE Study Material	4	50	**1**
vi.	a) Both A and R are true, and R is the correct explanation of A	CBSE Study Material	5	50	**1**
Q.5	**Answer any 5 out of the given 6 questions (1 x 5 = 5 marks)**				
i.	c) It accurately shows the middle of the dataset even with outliers	CBSE Study Material	1	7	**1**
ii.	c) 4/52 = 1/13	CBSE Study Material	2	24	**1**
iii.	a) True	CBSE Study Material	3	30	1
iv.	b) One to One Joins	CBSE Study Material	4	37	**1**
v.	b) 80^{th} percentile	CBSE Study Material	4	46	**1**
vi.	read	CBSE Study Material	5	49	**1**

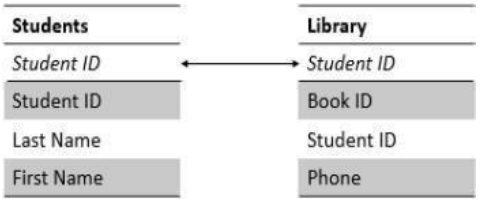
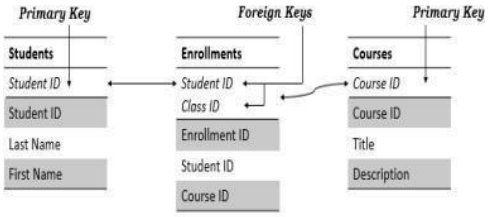
SECTION B: SUBJECTIVE TYPE QUESTIONS

Q. No.	QUESTION	Source Material (NCERT/ PSSCIV E/ 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	Completeness means that a message should include all necessary details so that the receiver does not need to ask again. For example, instead of writing "Submit documents soon," a complete message is: "Submit all salary related documents with signature by Monday, 5 pm, in the HR office." Courtesy means being polite, respectful, and considerate while communicating. Courteous messages help in building goodwill and positive relationships. For example, instead of saying "You are late again with your report," a courteous approach is: "Please ensure timely submission of your report so that work progresses smoothly." These principles are essential in workplaces to maintain professionalism, harmony, and clarity in tasks. (½ mark for each explanation; ½ mark for each example)	NCERT-EMPLOYABILITY SKILL	1	21	**2**
Q.7	a) Ravi is missing **Organise**. Keeping his study table clean and putting books back in place would save time. b) Organising will help him save time, reduce stress, and allow him to begin studying on time without frustration. (1 mark for each explanation)	NCERT-EMPLOYABILITY SKILL	2	60	**2**
Q. 8	To protect computer data from theft and viruses, we can take the following measures: **Use strong passwords:** Passwords should be a mix of capital letters, small letters, numbers, and special characters, making them difficult to guess or hack. **Install Anti-virus and Firewall:** These detect, clean, and prevent viruses from entering a system by monitoring incoming and outgoing data. **Encrypt Data:** Important files or even the entire hard disk can be encrypted using tools like BitLocker. This requires a decryption key, preventing unauthorised access. **Use Secure Sites:** Share sensitive details (like credit card info) only on websites starting with **https://** and showing a lock symbol. These measures ensure safe, secure, and private data usage. (1 mark for any two point)	NCERT-EMPLOYABILITY SKILL	3	81	**2**

Q.9	• Decision-making: Helps in choosing best business alternatives quickly. Wrong decisions may lead to failure. • Risk-taking: Business involves uncertainty. Entrepreneurs take calculated risks to achieve profit and success. (1 mark for explanation of Decision-making; 1 mark for explanation of Risk-taking)	NCERT-EMPLOYABILITY SKILL	4	93	**2**
Q.10	Fresh water is polluted by garbage and chemicals, reducing availability of clean water for drinking and other uses.	NCERT-EMPLOYABILITY SKILL	5	105	**2**
Answer any 4 out of the given 6 questions in 20 – 30 words each (2 x 4 = 8 marks)					
Q.11	a) The mean will be pulled upward by the outlier (47), so it will not truly represent the majority of students' performance. b) The Median should be used, as it represents the middle value and is not affected by the outlier. (1 mark each for writing the correct explanation of each question).	CBSE Study Material	1	7	**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	17	**2**
Q.13	(i) Survivor Bias. (ii) Wrong conclusions occur because the analysis ignores failures, which may hold important lessons. (1 mark for each explanation)	CBSE Study Material	3	29	**2**
Q.14	To find the Z-score for a 2nd grader who is 40 inches tall, you can use the Z-score formula: $Z=(X-\mu)/\sigma$ Given the values: • **X** (the height of the student) = 40 inches • **μ** (the mean height of 2nd graders) = 48 inches • **σ** (the standard deviation) = 2 inches Substitute these values into the formula: $Z=(40-48)/2$ $Z=-8/2$ $Z=-4$ The Z-score of a 2nd grader who is 40 inches tall is **-4**. This means the student's height is 4 standard deviations below the mean. (1 marks for formula and 1 marks for calculation)	CBSE Study Material	4	39	**2**
Q.15	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	40	**2**

Q.16	We can safely discard the data in one of the following ways. • Shredding the Documents • Burning the Documents	CBSE Study Material	5	50	**2**
	Cutting up the Documents (Any two; 1 mark for each)				
Answer any 3 out of the given 5 questions in 50– 80 words each (4 x 3 = 12 marks)					
Q.17	(i) Both City X and City Y (Mean = 30°C). (ii) City X, because SD = 2°C shows data is close to the mean, while City Y's SD = 9°C shows wide variation. (iii) It means predictions are less reliable, because they vary a lot from the mean. (iv) City X, because the forecast is more consistent and predictable. (1 mark for explaining right explanation of each question)	CBSE Study Material	1	6,10	**4**
Q.18	1. **Formulate Statistical Investigative Questions** — *anticipating variability* You pose clear, purposeful questions about a group (not an individual) that expect differences in the data (e.g., "Do plants exposed to more sunlight grow faster?"). These questions set up productive data collection and analysis. 2. **Collect/Consider the Data** — *acknowledging variability while designing for differences* Plan how to gather data (e.g., random sampling, experimental design with random assignment) and examine how variables were measured so you know the limits of generalization. The design should recognize and manage sources of variation. 3. **Analyze the Data** — *accounting for variability via distributions* Use graphs and numerical summaries (dot plots, boxplots, etc.) to describe and compare distributions, looking for overlap, separation, and other patterns that explain variation. 4. **Interpret the Results** — *allowing for variability while looking beyond the data* Draw conclusions that explicitly consider randomization and individual differences; when generalizing, account for these variability sources so inferences are justified. (½ marks for each type explanation and ½ marks for each example)	CBSE Study Material	2	19-21	**4**

Q.19	**(i) Concept of Central Limit Theorem:** The Central Limit Theorem states that as sample size increases, the distribution of sample means becomes approximately normal, regardless of the population's distribution. **(ii) Validity of using 500 households:** A large sample like 500 ensures that the sample mean is a good estimate of the population mean, making the prediction statistically valid. **(iii) Effect of larger sample size on accuracy:** Larger samples reduce the standard error (σ/√n), improving accuracy and reliability of results. **(iv) Case of 20 households:** With only 20 households, the sample is too small, the distribution may not approximate normal, and results are likely to be inaccurate. (1 marks for each part of question)	CBSE Study Material	3	30 - 32	**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	37-38	**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.  *Join Table* (1 mark for number of joins; 1 mark each for explanation of each type of join)				
Q.21	a) The office ignored the guideline of discarding unnecessary data. Old files should have been securely destroyed (cut up/shredded) instead of being stored carelessly. b) Sensitive information was leaked online, leading to privacy violations and potential misuse like identity theft. c) It ensures that once documents are destroyed, they cannot be read, reused, or reconstructed by unauthorized people. This protects privacy even after records are no longer needed. d) (i)Encryption of digital data - protect sensitive files from unauthorized access. (ii) Regular audits and accountability → ensure staff follow proper procedures for data disposal and privacy protection. (Part a, b, c are 1 mark, d have ½ marks of each above point or any valid point)	CBSE Study Material	5	49	**4**