

Marking Scheme
Strictly Confidential
(For Internal and Restricted use only)
Senior Secondary School Certificate Examination, 2025
SUBJECT NAME DATA SCIENCE (Q.P. CODE 368)

General Instructions: -

1	You are aware that evaluation is the most important process in the actual and correct assessment of the candidates. A small mistake in evaluation may lead to serious problems which may affect the future of the candidates, education system and teaching profession. To avoid mistakes, it is requested that before starting evaluation, you must read and understand the spot evaluation guidelines carefully.
2	“Evaluation policy is a confidential policy as it is related to the confidentiality of the examinations conducted, Evaluation done and several other aspects. Its’ leakage to public in any manner could lead to derailment of the examination system and affect the life and future of millions of candidates. Sharing this policy/document to anyone, publishing in any magazine and printing in Newspaper/Website, etc. may invite action under various rules of the Board and IPC.”
3	Evaluation is to be done as per instructions provided in the Marking Scheme. It should not be done according to one’s own interpretation or any other consideration. Marking Scheme should be strictly adhered to and religiously followed. However, while evaluating, answers which are based on latest information or knowledge and/or are innovative, they may be assessed for their correctness otherwise and due marks be awarded to them. In class-XII, while evaluating two competency-based questions, please try to understand given answer and even if reply is not from marking scheme but correct competency is enumerated by the candidate, due marks should be awarded.
4	The Marking scheme carries only suggested value points for the answers These are in the nature of Guidelines only and do not constitute the complete answer. The students can have their own expression and if the expression is correct, the due marks should be awarded accordingly.
5	The Head-Examiner must go through the first five answer books evaluated by each evaluator on the first day, to ensure that evaluation has been carried out as per the instructions given in the Marking Scheme. If there is any variation, the same should be zero after deliberation and discussion. The remaining answer books meant for evaluation shall be given only after ensuring that there is no significant variation in the marking of individual evaluators.
6	Evaluators will mark(√) wherever answer is correct. For wrong answer CROSS ‘X’ be marked. Evaluators will not put right (✓) while evaluating which gives an impression that answer is correct and no marks are awarded. This is most common mistake which evaluators are committing.
7	If a question has parts, please award marks on the right-hand side for each part. Marks awarded for different parts of the question should then be totaled up and written in the left-hand margin and encircled. This may be followed strictly.
8	If a question does not have any parts, marks must be awarded in the left-hand margin and encircled. This may also be followed strictly.

9	If a student has attempted an extra question, answer of the question deserving more marks should be retained and the other answer scored out with a note “Extra Question” .
10	No marks to be deducted for the cumulative effect of an error. It should be penalized only once.
11	A full scale of marks _____(example 0 to 80/70/60/50/40/30 marks as given in Question Paper) has to be used. Please do not hesitate to award full marks if the answer deserves it.
12	Every examiner has to necessarily do evaluation work for full working hours i.e., 8 hours every day and evaluate 20 answer books per day in main subjects and 25 answer books per day in other subjects (Details are given in Spot Guidelines).This is in view of the reduced syllabus and number of questions in question paper.
13	<p>Ensure that you do not make the following common types of errors committed by the Examiner in the past:-</p> <ul style="list-style-type: none"> • Leaving answer or part thereof unassessed in an answer book. • Giving more marks for an answer than assigned to it. • Wrong totaling of marks awarded on an answer. • Wrong transfer of marks from the inside pages of the answer book to the title page. • Wrong question wise totaling on the title page. • Wrong totaling of marks of the two columns on the title page. • Wrong grand total. • Marks in words and figures not tallying/not same. • Wrong transfer of marks from the answer book to online award list. • Answers marked as correct, but marks not awarded. (Ensure that the right tick mark is correctly and clearly indicated. It should merely be a line. Same is with the X for incorrect answer.) • Half or a part of answer marked correct and the rest as wrong, but no marks awarded.
14	While evaluating the answer books if the answer is found to be totally incorrect, it should be marked as cross (X) and awarded zero (0)Marks.
15	Any unassessed portion, non-carrying over of marks to the title page, or totaling error detected by the candidate shall damage the prestige of all the personnel engaged in the evaluation work as also of the Board. Hence, in order to uphold the prestige of all concerned, it is again reiterated that the instructions be followed meticulously and judiciously.
16	The Examiners should acquaint themselves with the guidelines given in the “Guidelines for Spot Evaluation” before starting the actual evaluation.
17	Every Examiner shall also ensure that all the answers are evaluated, marks carried over to the title page, correctly totaled and written in figures and words.
18	The candidates are entitled to obtain photocopy of the Answer Book on request on payment of the prescribed processing fee. All Examiners/Additional Head Examiners/Head Examiners are once again reminded that they must ensure that evaluation is carried out strictly as per value points for each answer as given in the Marking Scheme.

MARKING SCHEME

DATA SCIENCE

SECTION A

OBJECTIVE TYPE QUESTIONS

Q. No.	Question	Source Material	Unit/ Ch.No.	Page No.	Marks
1.	Answer any 4 out of the given 6 questions on Employability skills.				4×1=4
(i)	(D) Five Factor Model	NCERT	2	33	1
(ii)	(C) Unavailability of monetary resources on time.	NCERT	4	91	1
(iii)	(C) The manager is writing the report.	NCERT	1	18	1
(iv)	(C) Ctrl + M	NCERT	3	70	1
(v)	(C) Intrinsic motivation	NCERT	2	24	1
(vi)	(B) small-scale	NCERT	5	117	1
2.	Answer any 5 out of the given 6 questions.				5×1=5
(i)	FALSE	CBSE-Microsoft Student Handbook	1	2	1
(ii)	(A) Univariate Analysis	CBSE-Microsoft Student Handbook	2	9	1
(iii)	(C) Random Forest Algorithm	CBSE-Microsoft Student Handbook	3	15	1
(iv)	(C) Lazy learning and non-parametric learning	CBSE-Microsoft Student Handbook	4	23	1

(v)	(C) Linear Regression	CBSE- Microsoft Student Handbook	5	34	1
(vi)	(B) Unsupervised Learning	CBSE- Microsoft Student Handbook	7	44	1
3.	Answer any 5 out of the given 6 questions.				5×1=5
(i)	(A) California Consumer Privacy Act	CBSE- Microsoft Student Handbook	1	3	1
(ii)	(B) 2 and 3	CBSE- Microsoft Student Handbook	2	11	1
(iii)	(C) Mode	CBSE- Microsoft Student Handbook	3	16	1
(iv)	(B) K-NN struggles to predict the output accurately with an increasing number of input variables.	CBSE- Microsoft Student Handbook	4	24	1
(v)	(C) A is true, but R is false.	CBSE- Microsoft Student Handbook	5	35	1
(vi)	True	CBSE- Microsoft Student Handbook	7	45	1
4.	Answer any 5 out of the given 6 questions.				5×1=5
(i)	(A) The right of individuals to control how their personal information is collected and used.	CBSE- Microsoft Student Handbook	1	2	1

(ii)	(C) Multivariate	CBSE- Microsoft Student Handbook	2	9	1
(iii)	(D) Objects that are similar tend to be located close to each other.	CBSE- Microsoft Student Handbook	4	26	1
(iv)	(C) Continuous	CBSE- Microsoft Student Handbook	5	33	1
(v)	(B) Non-Linear Regression	CBSE- Microsoft Student Handbook	6	41	1
(vi)	(C) Detecting unusual data points	CBSE- Microsoft Student Handbook	7	44	1
5.	Answer any 5 out of the given 6 questions.				5×1=5
(i)	(B) Children's	CBSE- Microsoft Student Handbook	1	3	1
(ii)	(A) Regression trees are suitable for continuous dependent variables, while classification trees are suitable for categorical dependent variables.	CBSE- Microsoft Student Handbook	3	16	1
(iii)	(A) Cross validation	CBSE- Microsoft Student Handbook	4	25	1
(iv)	(B) Minimising the Mean Absolute Error (MAE).	CBSE- Microsoft Student Handbook	5	34	1

(v)	(B) Multi-Linear Regression	CBSE- Microsoft Student Handbook	6	41	1
(vi)	(B) Expectation-Maximisation	CBSE- Microsoft Student Handbook	7	46	1

Section-B
Subjective Type Questions

Q. No.	Question	Source Material	Unit/ Ch.No.	Page No.	Marks
--------	----------	--------------------	-----------------	-------------	-------

Answer any **3** out of the given **5** questions on Employability Skills in
20-30 words each.

3×2=6

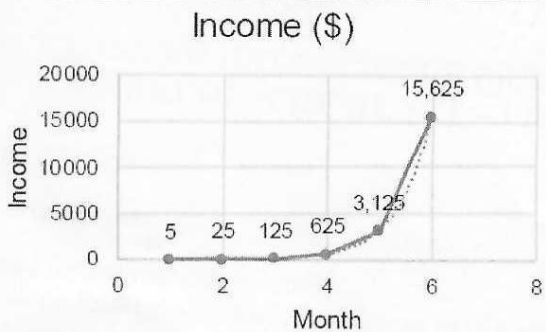
6.	The words 'a', 'an' and 'the' are known as articles. Example : The car stopped suddenly because a cat ran in front of it. 1 mark for the definition 1 mark for example	NCERT	1	12	2
7.	(A) = (B) =C3*D3 1 mark for each part	NCERT	3	50-52	2
8.	(A) Dependent Personality Disorder (B) Narcissistic Personality Disorder 1 mark for each part	NCERT	2	35-36	2
9.	Use of energy-efficient vehicles and alternate fuels like CNG can help minimize greenhouse gas emissions, The Government of India's biofuel policy, introduced in August 2018, emphasis increasing ethanol production from biomass for greener fuel options. This initiative aims to reduce greenhouse gas emissions and promote green jobs. Additionally, the Energy Efficiency Services Limited (EESL) launched an electric vehicle program to foster the adoption of	NCERT	5	115	2

	electric vehicles across various transport modes, aiming to revolutionise India's mobility landscape and create opportunities in the automotive sector through skill training and new market entrants. 2 mark for each answer				
10.	<ul style="list-style-type: none"> • Hard Work : Essential for addressing daily challenges and seizing opportunities with dedication beyond office hours. • Decision-Making : Timely decisions are critical in fast-paced business environments to capitalize on opportunities and avoid losses. • Initiative : Proactively initiating actions to seize opportunities as they arise. • Risk-taking : Willingness to embrace risks inherent in business ventures. • Learning from Experience : Adapting and improving based on past mistakes to avoid recurring errors. • Motivation : Driven by a persistent desire to achieve goals despite obstacles. • Self-Confidence : Essential for leadership, inspiring others, and overcoming challenges with courage and enthusiasm. Any 2 of the above/similar points 1 mark each	NCERT	4	81	2
Answer any 4 out of the given 6 questions in 20-30 words each. 4×2=8					
11.	<p>Two ethical guidelines relevant to software development and data management are :</p> <ul style="list-style-type: none"> • Keeping data secure : Ensuring 	CBSE- Microsoft Student Handbook	1	2	2

	<p>that sensitive information is protected from unauthorised access or breaches.</p> <ul style="list-style-type: none"> • Creating impartial and robust machine learning models : Developing algorithms that do not discriminate and are resilient against biases, ensuring fair and accurate outcomes. <p>Any 2 of the above/Similar points-1 mark each</p>				
12.	<p>Univariate Analysis : bar charts, histograms, frequency polygons, and pie charts.</p> <p>Bivariate analysis : Scatter plots, line charts, and pair plots.</p> <p>1 mark each for naming any 1 graph/chart</p>	CBSE-Microsoft Student Handbook	2	8-9	2
13	<p>Cross Validation is a technique in which we reserve a portion of a dataset on which we do not train the model. After the training is over, we test the resulting model on this portion of the data.</p> <p>2 marks for valid answer</p>	CBSE-Microsoft Student Handbook	4	25-26	2
14	<p>The difference between them is as follows :</p> <ol style="list-style-type: none"> 1. Regression trees are used when the dependent variable is continuous. Classification trees are used when the dependent variable is categorical. 2. In case of a regression tree, the value of the terminal nodes after training is the mean of the observations. Thus, predictions on unseen data are made using the mean. 3. In case of a classification tree, the value or class of the terminal nodes 	CBSE-Microsoft Student Handbook	3	16	2

	after training is the mode of the observations. Thus, predictions on unseen data are made using the mode. 2 marks for above two/similar valid points				
15.	Mathematically, the Root Mean Square Deviation is the square root of the variance of the residuals. It is used to determine how close the observed points are to the model's predicted values. 2 marks for correct answer	CBSE- Microsoft Student Handbook	5	35	2
16.	The k-means clustering method. This method is a technique that is used to spot clusters of data classes in a dataset. 2 marks for valid answer	CBSE- Microsoft Student Handbook	7	45	2
Answer any 3 out of the given 5 questions in 20-30 words each.					3×4=12
17.	PDP - Personal Data Protection Bill The Personal Data Protection Bill 2019 was tabled in the Indian Parliament by the Ministry of Electronics and Information Technology on 11 December 2019. As of March 2020, the Bill is being analysed by a Joint Parliamentary Committee (JPC) in consultation with experts and stakeholders. The Bill covers mechanisms for the protection of personal data and proposes the setting up of a Data Protection Authority of India for it. 1 mark for abbreviation and 3 marks for explaining PDP	CBSE- Microsoft Student Handbook	1	4	4
18.	Multivariate analysis is a more complex form of statistical analysis technique and is used to analyse	CBSE- Microsoft Student	2	9-10	4

	<p>more than two variables in the data set. There are several ways to do a multivariate analysis, but it depends on your goals. Some of these methods include Canonical Correlation Analysis, Cluster Analysis, contour plots, and Principal Component Analysis. Example: In educational research, multivariate analysis like multiple regression can reveal how variables such as study time, attendance, and extracurricular activities collectively impact student exam scores, offering insights into effective interventions for academic improvement.</p> <p>3 marks for valid explanation 1 mark for above/similar example</p>	Handbook			
19.	<ul style="list-style-type: none"> • Effective for non-linear trends in data where linear models may fail to produce accurate results. • Suitable for both classification and regression tasks, accommodating diverse problem types. • Easy to visualise and interpret, making them accessible even to non-analytical backgrounds. • Can handle both numerical and categorical variables without extensive data preprocessing. • Resilient to outliers and missing data to a reasonable extent compared to other modelling techniques. • Decision tree outputs are very easy to understand even for people from a non-analytical background. <p>Any 4 of the above/similar points-1 mark each</p>	CBSE- Microsoft Student Handbook	3	15-16	4
20.	<p>(A) Non-Linear regression</p> <p>(B) $y \sim f(x, \beta)$ where x is a vector of independent variables and y is the</p>	CBSE- Microsoft Student	6	41	4

	<p>dependent variable.</p> <p>(C)</p>  <p>1 mark for part A 1 mark for part B 2 marks for part C</p>	Handbook			
21	<p>(A) Clustering refers to the process of dividing entire raw data into several groups such that the data points in one group are similar to other data points in the same group but different from those in other groups. Clustering techniques apply when there is no class to be predicted but rather when the instances are to be divided into natural groups.</p> <p>(B) Some of the main clustering methods are :</p> <ul style="list-style-type: none"> • Partitioning Clustering • Density-Based Clustering • Distribution Model-Based Clustering • Hierarchical Clustering <p>1 mark for definition 1 mark for any correct example 1 mark each for correct clustering method</p>	CBSE- Microsoft Student Handbook	7	45	4