

Data Analytics (315326)

MSBTE Diploma · K-Scheme · Semester 5 (CO / CM / IF and allied) · Important Questions — unit-wise

Based on MSBTE papers W-2025 and S-2026 (the only two papers of this K-scheme subject available on msbte.ac.in) and the official K-scheme syllabus. Practice guidance only — not a prediction of the exam.

Probability: High = asked in both papers (or 3+ times) · **Medium** = asked once · **Low** = in syllabus but not asked yet. With only two papers, these are trends, not certainties — study the full syllabus.

Unit	Title	Syllabus marks	Marks seen in papers (W-25 + S-26)
1	Introduction to Data Analytics	16	18 + 22
2	Statistical Analysis	16	30 + 24
3	Data Analytics with Excel	12	16 + 18
4	Data Visualization (Excel charts)	12	16 + 18
5	Data Visualization using Python (Matplotlib)	14	22 + 20

Paper marks include optional questions (e.g. 7 questions printed in Q.1, any 5 to attempt), so they are higher than the syllabus marks.

Unit I — Introduction to Data Analytics (syllabus: 16 marks)

Question / topic	Marks	Asked in	Count	Probability
Define Data Analytics / state its importance W-25 Q.1a: Define Data Analytics. S-26 Q.1a: Define Data Analytics. State any two importance.	2	S-26, W-25	2	High
Life cycle of Data Analytics (steps / phases, with diagram) W-25 Q.2a: Describe the steps of the Data Analytics life cycle. S-26 Q.2a: Describe life cycle of Data Analytics in detail with neat diagram.	4	S-26, W-25	2	High
Central Limit Theorem (and sampling funnel) W-25 Q.1b: State the central limit theorem. S-26 Q.5b: Explain sampling funnel and central limit theorem with example.	2, 6	S-26, W-25	2	High
Measures of dispersion: variance, SD, mean deviation, quartile deviation (theory + numerical) W-25 Q.4a: Explain variance and standard deviation with an example. S-26 Q.4c: Coefficient of mean deviation [2,4,6]; coefficient of quartile deviation [1,3,5,7,9].	4	S-26, W-25	2	High
Mean, median and mode — numerical W-25 Q.5a: Scores [17,5,12,10,8,20,10,15,12,6]: mean, median, mode.	6	W-25	1	Medium
Types of data analytics (descriptive vs predictive etc.)	4	S-26	1	Medium

S-26 Q.3a: Differentiate between descriptive analysis and predictive analysis.				
Data types in Data Analytics S-26 Q.1e: Give data types in Data Analytics.	2	S-26	1	Medium
Diagnostic and prescriptive analytics; visual analytics	—	Not yet	0	Low
Quality and quantity of data, measurement	—	Not yet	0	Low
Confidence interval and sampling variation	—	Not yet	0	Low

Unit II — Statistical Analysis (syllabus: 16 marks)

Question / topic	Marks	Asked in	Count	Probability
Skewness and kurtosis (definition / types) W-25 Q.1c: Define Kurtosis. S-26 Q.1d: Define skewness and kurtosis.	2	S-26, W-25	2	High
Box plot / five-number summary / IQR outlier detection W-25 Q.2b: Construct a box plot for [12,15,14,10,18,20,22]. S-26 Q.6a: IQR method to identify outlier in 11 values; draw box plot and highlight outlier.	4, 6	S-26, W-25	2	High
Correlation and regression (explain / differentiate) W-25 Q.3b: Differentiate between correlation and regression. S-26 Q.4b: Explain correlation and regression in detail.	4	S-26, W-25	2	High
Binomial distribution / probability (coin) numerical W-25 Q.4b: Explain Binomial distribution with example. W-25 Q.6a: Coin tossed three times; P(exactly two heads), P(at least two heads).	4, 6	W-25	2	Medium
Skewness — numerical W-25 Q.5b: Determine skewness for [1,2,2,3,10].	6	W-25	1	Medium
Normal distribution — importance W-25 Q.3a: Explain the importance of normal distribution in statistics.	4	W-25	1	Medium
Spearman's rank correlation — numerical S-26 Q.2c: Spearman's correlation for $x=[10..50]$, $y=[30,40,10,20,50]$.	4	S-26	1	Medium
Chi-square test of association — numerical S-26 Q.5a: Gender vs learning platform 2x3 table, chi-square at 5%.	6	S-26	1	Medium
Steps in data cleaning S-26 Q.1g: List various steps in data cleaning.	2	S-26	1	Medium
Imputation techniques for missing values	—	Not yet	0	Low
ANOVA (one-way)	—	Not yet	0	Low
Scatter diagram	—	Not yet	0	Low
Estimation and hypothesis testing (H_0, H_1, Type I/II error)	—	Not yet	0	Low

Sampling distributions, counting (permutation / combination)	—	Not yet	0	Low
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Unit III — Data Analytics with Excel (syllabus: 12 marks)

Question / topic	Marks	Asked in	Count	Probability
Creating a pivot table (stepwise procedure) W-25 Q.5c: Stepwise procedure to create a Pivot table to summarize sales by region. S-26 Q.3d: Explain steps for creating a pivot table in excel.	4, 6	S-26, W-25	2	High
Excel dashboard (role / steps / elements) W-25 Q.4c: Role of dashboards in consolidating Excel visualization and control. S-26 Q.6c: Steps for making excel dashboard; draw different elements.	4, 6	S-26, W-25	2	High
Pivot table vs pivot chart W-25 Q.2c: Differentiate between Pivot table and Pivot chart.	4	W-25	1	Medium
Slicer in Excel W-25 Q.1d: Define a slicer in Excel.	2	W-25	1	Medium
Sorting and filtering in a pivot table S-26 Q.2d: Explain steps for sorting and filtering in pivot table.	4	S-26	1	Medium
Pivot chart with grouping of items S-26 Q.4d: Create pivot chart for different types of grouping item (student marks data).	4	S-26	1	Medium
Tables and data grids, dynamic filters and controls, trend analysis and forecasting	—	Not yet	0	Low
Calculated field, updating (refresh) and formatting a pivot table	—	Not yet	0	Low

Unit IV — Data Visualization (Excel charts) (syllabus: 12 marks)

Question / topic	Marks	Asked in	Count	Probability
Pie chart — create, add labels, explode a slice W-25 Q.2d: Purpose of a pie chart slice explosion. W-25 Q.6b: Household expenditure pie chart with data labels; explode food slice. S-26 Q.3c: Pie chart A=30,B=25,C=20,D=25; steps to explode largest slice and add label.	4, 6	S-26, W-25	3	High
Chart types in Excel / line chart advantages W-25 Q.1e: Name four common chart types in Excel. W-25 Q.3c: Write any four advantages of line chart.	2, 4	W-25	2	Medium
Creating a chart using Chart Wizard S-26 Q.1b: Give the steps to create chart using chart wizards.	2	S-26	1	Medium
Formatting plot area vs chart area S-26 Q.2b: Differentiate between formatting the plot area and formatting chart area.	4	S-26	1	Medium

Draw a suitable chart for given tabular data <i>S-26 Q.4a: Books / Stationary for 2022-23 to 2024-25.</i>	4	S-26	1	Medium
Moving an embedded chart within a worksheet <i>S-26 Q.4e: Steps to move an embedded chart to a new position within same worksheet.</i>	4	S-26	1	Medium
Charting non-adjacent cells	—	Not yet	0	Low
Changing chart type, moving the legend, formatting data markers	—	Not yet	0	Low
Moving a pie chart to its own sheet	—	Not yet	0	Low

Unit V — Data Visualization using Python (Matplotlib) (syllabus: 14 marks)

Question / topic	Marks	Asked in	Count	Probability
Matplotlib overview and types of plots <i>W-25 Q.3d: Describe Matplotlib and state any four types of plots it supports.</i> <i>S-26 Q.1c: List any four types of plots in matplotlib.</i>	2, 4	S-26, W-25	2	High
Titles, labels and legends (plt.title(), plt.legend()) <i>W-25 Q.6c: Role of labels, titles and legends in Matplotlib plots with example.</i> <i>S-26 Q.1f: Role of plt.title() and plt.legend().</i>	2, 6	S-26, W-25	2	High
Python program — bar chart (title, labels, legend, save) <i>W-25 Q.4e: Bar chart of sales of five products, save as PNG.</i> <i>S-26 Q.5c: Bar chart comparing divisions A, B, C over five years with legend.</i>	4, 6	S-26, W-25	2	High
Saving plots in different formats (PNG/PDF/SVG) <i>W-25 Q.1g: Two formats in which Matplotlib plots can be saved.</i>	2	W-25	1	Medium
pyplot module <i>W-25 Q.1f: Use of the pyplot module in Matplotlib.</i>	2	W-25	1	Medium
Python program — histogram <i>W-25 Q.4d: Histogram of student marks with title and axis labels.</i>	4	W-25	1	Medium
Python program — line chart with title, labels, legend <i>S-26 Q.6b: Line chart with titles, labels and legends.</i>	6	S-26	1	Medium
Installing and setting up Matplotlib <i>S-26 Q.3b: Steps for installing and setting up matplotlib in Python.</i>	4	S-26	1	Medium
Scatter plot	—	Not yet	0	Low
Figure size / aspect ratio, axis limits and ticks	—	Not yet	0	Low
Resolution (dpi) of saved plots; Matplotlib widgets	—	Not yet	0	Low

Paper pattern (same in W-2025 and S-2026)

Q.	Attempt	Marks each	Total
1	Any FIVE of 7	2	10
2	Any THREE of 4	4	12
3	Any THREE of 4	4	12
4	Any THREE of 5	4	12
5	Any TWO of 3	6	12
6	Any TWO of 3	6	12
	3 Hours		70

Note: This is an **important-questions list prepared by Ananda Technologies** only for practice and exam preparation, based on the pattern of previous MSBTE question papers and the K-scheme syllabus. It is **not an official MSBTE paper**, and it does **not** mean that these questions will come in the exam. Answers follow standard textbook points; marks shown are indicative. Free for students — anandatechnologies.in