

Data Analytics (315326)

MSBTE Diploma · K-Scheme · Model Question Paper — Set C

Time: 3 Hours
Max. Marks: 70
Instructions:

1. All questions are compulsory.
2. Answer each next main question on a new page.
3. Illustrate your answers with neat sketches wherever necessary.
4. Figures to the right indicate full marks.
5. Assume suitable data, if necessary.
6. Mobile phone, pager and any other electronic communication devices are not permissible in the examination hall.

Q.1 Attempt any FIVE of the following:
10

- a) Define Data Analytics. Name any two tools used for data analytics.
- b) What is skewness? Write the relation between mean, median and mode in a positively skewed distribution.
- c) State any four properties of the normal distribution.
- d) What is a calculated field in a PivotTable? Give an example.
- e) List any four chart elements that can be added to an Excel chart.
- f) Write the syntax of `plt.savefig()`. State the use of its `dpi` parameter.
- g) Define null hypothesis and alternative hypothesis.

Q.2 Attempt any THREE of the following:
12

- a) What is data cleaning? Explain the steps of data cleaning with a flow diagram.
- b) Construct a box plot for the following data and state its five-number summary:
32, 45, 38, 50, 41, 36, 47, 55
- c) With the help of the life-cycle diagram, explain the Discovery and Data Preparation phases of data analytics.
- d) Write the steps to create a pie chart in Excel, move it to its own chart sheet and add data labels.

Q.3 Attempt any THREE of the following:
12

- a) What is ANOVA? Explain one-way ANOVA with its steps.
- b) Explain how to group items in a PivotTable (dates by month and items into categories) and create a Pivot Chart, for the stationery sales data below.

Item	Date	Qty
Pen	03-04-2025	120
Pencil	11-04-2025	80

Notebook	21-04-2025	60
Register	02-05-2025	40
Pen	15-05-2025	150
Notebook	26-05-2025	70
Pencil	06-06-2025	90
Register	18-06-2025	55

- Explain with a program how to change the figure size and customise the axis limits, ticks and labels in Matplotlib.
- Explain mean, median and mode with a suitable example.

Q.4 Attempt any THREE of the following:

12

- State any four points of difference between correlation analysis and regression analysis.
- State the Central Limit Theorem. Explain its importance in data analytics.
- Draw a suitable chart for the following data of crop production (in tonnes) and name the chart:

Crop	2022-23	2023-24	2024-25
Wheat	420	460	500
Rice	310	290	340
Jowar	180	210	190

- Write a Python program to draw a scatter plot of study hours versus marks of 12 students. Add title, axis labels and legend.
- Explain the use of slicers to filter and format a PivotTable.

Q.5 Attempt any TWO of the following:

12

- The daily sales (in units) of a shop for 8 days are: 24, 30, 28, 36, 22, 40, 30, 30. Calculate range, variance, standard deviation and coefficient of variation.
- Explain the types of skewness and kurtosis with neat diagrams.
- Write a Python program using pandas and Matplotlib to create a DataFrame of quarter-wise sales of four regions, show the summary table and draw a bar chart with title, axis labels and legend. Save it as a PNG file.

Q.6 Attempt any TWO of the following:

12

- Explain the following features of an Excel dashboard: i) Tables and data grids ii) Dynamic filters and controls iii) Trend analysis and forecasting.
- Marks of 1000 students are normally distributed with mean 60 and standard deviation 10. Find the number of students who scored i) more than 75 marks ii) between 50 and 70 marks.

- c) Write a Python program to show a line chart and a bar chart of the same data side by side in one figure using subplots, and save the figure at 300 dpi. Explain the functions used.

Note: This is a **model question paper 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

