5 MJ 60514 B

FOUR YEAR B.Sc. (Honours) DEGREE EXAMINATION, NOVEMBER/DECEMBER 2025.

FIFTH SEMESTER

Computer Science

Paper XIII – FOUNDATION OF DATA SCIENCE

(w.e.f. 2023–24 Regulations)

Time : Three hours Maximum : 70 marks

(No additional sheet will be supplied)

SECTION A — (5 × 4 = 20 marks)

Answer any FIVE questions.

1. Define Data Science and explain its evolution.
2. Explain about data integration.
3. Discuss the concept of skewness and kurtosis in descriptive statistics.
4. Explain NoSQL databases and their types.
5. Explain NumPy arrays and their importance in Data Science.
6. Discuss Boolean indexing in NumPy with an example.
7. Explain Series and DataFrame in pandas.
8. Describe indexing and filtering operations in pandas.
9. Explain the process of handling missing data in data cleaning.
10. Describe the use of scatter plots and histograms in data visualization.

SECTION B — (5 × 10 = 50 marks)

Answer ALL the following questions.

11. Explain the Data Science process in detail with a diagram.

Or

12. Explain different data reduction techniques.

13. Explain ANOVA and its use in data analysis.

Or

14. Describe the role of pivot tables and heat maps in data analysis.

15. Explain the basics of NumPy and describe different methods to create ndarrays with examples.

Or

16. Discuss universal functions in NumPy and their role in element-wise computation.

17. Explain the structure of pandas DataFrame and essential functionalities with examples.

Or

18. Describe reading and writing data in text format using pandas.

19. Explain data transformation techniques for cleaning datasets.

Or

20. Discuss plotting with pandas and explain the uses of line plots and bar plots.
