

# CBCS SCHEME

21CS644/21IS644/21IC644



## Sixth Semester B.E./B.Tech. Degree Examination, Dec.2025/Jan.2026 Data Science and Visualization

Max. Marks: 100

**Note: Answer any FIVE full questions, choosing ONE full question from each module.**

### Module-1

- 1 a. Define Data Science. Explain the current landscape with a neat diagram. (08 Marks)
- b. Explain the Data Science work profile. (08 Marks)
- c. What is Datafication? Explain with examples. (04 Marks)

OR

- 2 a. Explain the following concepts with examples: (08 Marks)
  - (i) Statistical inference
  - (ii) Population
  - (iii) Samples
  - (iv) Random variables
- b. Explain probability distribution with example. (08 Marks)
- c. Discuss fitting of a model. Explain overfitting with example. (04 Marks)

### Module-2

- 3 a. Explain Exploratory Data Analysis with example. (08 Marks)
- b. With a neat diagram, demonstrate the Data Science process. (08 Marks)
- c. Compare clustering and classification. (04 Marks)

OR

- 4 a. Explain K-NN with an example. (08 Marks)
- b. Briefly explain Linear Regression Algorithm. (08 Marks)
- c. List the advantages and issues in K-means algorithm. (04 Marks)

### Module-3

- 5 a. List the feature selection methods. Explain each in detail. (08 Marks)
- b. What is Crowdsourcing? Discuss the Kaggle Model. (08 Marks)
- c. Define Bagging. Write a short note on Random Forest. (04 Marks)

OR

- 6 a. Explain Decision Tree and construct an example Decision Tree. (08 Marks)
- b. What is Dimensionality problem? Illustrate Principal Component Analysis. (08 Marks)
- c. List and explain the problems with Nearest Neighbors. (04 Marks)

### Module-4

- 7 a. With a suitable diagram, explain the steps involved in Data Wrangling process. (08 Marks)
- b. Explain what Line, Bar and Radar charts are. Also explain their uses and Design practices. (08 Marks)
- c. Explain Heatmaps and its variant in detail. (04 Marks)

OR

- 8 a. Discuss various distribution plots. (08 Marks)  
b. Explain Histogram plots with example. Compare Histogram and Density plots. (08 Marks)  
c. Discuss Venn Diagram with an example. (04 Marks)

**Module-5**

- 9 a. What is Pyplot? List and explain the common operations that are performed using Pyplot. (08 Marks)  
b. With a suitable figure, explain basic text functions. (08 Marks)  
c. Briefly explain Legends with an example. (04 Marks)

OR

- 10 a. Describe Histogram and its parameters. Mention the functions for plotting basic and 2D Histograms and explain with example plots. (08 Marks)  
b. Demonstrate the basic operations for designing an image. (08 Marks)  
c. Using a simple code, demonstrate writing of mathematical expressions. Also give 2 Tex examples. (04 Marks)

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