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# P.E.S. College of Engineering, Mandya - 571 401

(An Autonomous Institution affiliated to VTU, Belagavi)

Sixth Semester, B.E. - Information Science and Engineering

Model Question Paper

Data Science

Time: 3 hrs

Max. Marks: 100

**Note:** Answer **FIVE** full questions, selecting **ONE** full question from each unit.

## UNIT - I

- 1 a. Describe what data science is and the skill sets needed to be a data scientist. 10
  - b. With a neat diagram, explain Drew Conway's Venn diagram of data science. 10
  - 2 a. Explain the following: 10
    - i) Statistical Inference
    - ii) Populations and Samples
  - b. Identify probability distributions commonly used as foundations for statistical modeling. 10
- Explain any two probability distributions.

## UNIT - II

- 3 a. Explain the significance of Exploratory Data Analysis (EDA) in data science. 10
- b. Describe the data science process and how its components interact? 10
- 4 a. Explain Linear Regression algorithm for predictive modeling. 10
- b. Explain k-means algorithm for predictive modeling. 10

## UNIT - III

- 5 a. Why Linear Regression and k-NN are poor choices for Filtering Spam? Explain. 10
- b. Illustrate with an example, how Naïve Bayes works for Filtering Spam? 10
- 6 a. With an example illustrate the concept of Feature Generation. 10
- b. Discuss Decision Tree algorithm. 10

## UNIT - IV

- 7 a. List out and explain the problems the nearest neighbors poses to generate ideas and recommendations. 10
- b. Explain the following: 10
  - i) SVD
  - ii) PCA
- 8 a. Define social network and explain the essential characteristics of a social network. 10
- b. Explain any two techniques used for discovering communities directly in a social network. 10

## UNIT - V

- 9 a. Explain basic principles and ideas of data visualization. 10
- b. Discuss the tools used for data visualization. 10
- 10 a. List any five examples of inspiring (industry) projects for data visualization. 5
- b. Explain the following with respect to data science: 15
  - i) privacy
  - ii) security
  - iii) ethics