| Roll No. | | | | | | | | | | | | |
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# PRESIDENCY UNIVERSITY

## BENGALURU

**Mid-Term Examinations – October 2025**

**Date:** 27-10-2025 **Time:** 11.00am to 12.30pm

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|---|---|---|
| **School:** SOCSE **Time:** 11.00am to 12.30pm | **Program:** M.Tech CSE Specialization in Data Science | |
| **Course Code:** DSC4002 | **Course Name:** Data Analytics and Visualization | |
| **Semester:** I | **Max Marks:** 50 | **Weightage:** 25% |

| **CO - Levels** | **CO1** | **CO2** | **CO3** | **CO4** | **CO5** |
|---|---|---|---|---|---|
| **Marks** | **36** | **14** | | | |

**Instructions:**

*(i) Read all questions carefully and answer accordingly.*

*(ii) Do not write anything on the question paper other than roll number.*

**Part A**

**Answer ALL the Questions. Each question carries 2marks.** **5Q x 2M=10M**

| | | | | |
|---|---|---|---|---|
| 1 | What are the main characteristics of data? | **2 Marks** | **L1** | **CO1** |
| 2 | What are the four main types of data analytics? | **2 Marks** | **L1** | **CO1** |
| 3 | Role of geospatial data in urban planning decisions? | **2 Marks** | **L1** | **CO1** |
| 4 | Significance of hyperparameter tuning after model training? | **2 Marks** | **L2** | **CO2** |
| 5 | Impact of distance metric choice on unsupervised clustering? | **2 Marks** | **L2** | **CO2** |

**Part B**

**Answer the Questions.** **Total Marks 40M**

<table>
<tr><td>6.</td><td>a.</td><td>Explain the different types of data used in analytics. Distinguish between structured, semi-structured, and unstructured data with suitable real-world examples.</td><td>10 Marks</td><td>L1</td><td>CO 1</td></tr>
<tr><td colspan="6">Or</td></tr>
<tr><td>7.</td><td>a.</td><td>Describe the four main types of analytics. Explain the role of each type in business decision-making with examples.</td><td>10 Marks</td><td>L1</td><td>CO 1</td></tr>
<tr><td>8.</td><td>a.</td><td>Given a business scenario, illustrate how descriptive, diagnostic, predictive, and prescriptive analytics can be applied, and explain the role of each in supporting effective decision-making.
<table>
<tr><th>Date</th><th>Product</th><th>Units Sold</th><th>Revenue ($)</th><th>Ad Spend ($)</th><th>Region</th></tr>
<tr><td>2025-09-01</td><td>Shoes</td><td>120</td><td>6,000</td><td>1,000</td><td>North</td></tr>
<tr><td>2025-09-01</td><td>Bags</td><td>80</td><td>4,000</td><td>500</td><td>North</td></tr>
<tr><td>2025-09-02</td><td>Shoes</td><td>90</td><td>4,500</td><td>700</td><td>South</td></tr>
<tr><td>2025-09-02</td><td>Bags</td><td>40</td><td>2,000</td><td>300</td><td>South</td></tr>
<tr><td>2025-09-03</td><td>Shoes</td><td>150</td><td>7,500</td><td>1,200</td><td>East</td></tr>
</table></td><td>10 Marks</td><td>L2</td><td>CO 1</td></tr>
<tr><td colspan="6">Or</td></tr>
<tr><td>9.</td><td>a.</td><td>Define location analytics, its importance in business decision-making, and how to analyze and visualize geospatial data effectively.</td><td>10 Marks</td><td>L1</td><td>CO 1</td></tr>
<tr><td>10.</td><td>a.</td><td>Explain dimensionality reduction in data analytics, comparing PCA and t-SNE, highlighting their pros, cons, and uses.</td><td>10 Marks</td><td>L2</td><td>CO 1</td></tr>
<tr><td colspan="6">Or</td></tr>
</table>

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|---|---|---|---|---|---|
| 11. | a. | Explain the process of feature engineering and feature selection in data analytics. Describe common techniques and discuss their impact on improving the performance of machine learning models. | **10 Marks** | **L1** | **CO 1** |

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|---|---|---|---|---|---|
| 12. | a. | Explain how cluster analysis facilitates pattern discovery in unsupervised learning, and compare the characteristics of hierarchical and partition-based clustering methods. | **10 Marks** | **L1** | **CO 2** |
| | | **Or** | | | |
| 13. | a. | Explain the role of statistical methods in data analytics. Discuss how hypothesis testing, correlation analysis, and regression analysis help in understanding and interpreting data patterns. | **10 Marks** | **L1** | **CO 2** |