Roll No.												

PRESIDENCY UNIVERSITY

BENGALURU

End - Term Examinations – December 2025

Date: 18 – 12- 2025 **Time:** 01:00pm – 04:00pm

School: SOCSE	**Program:** B.Tech. Computer Science and Engineering(Data Science)	
Course Code: CSD3406	**Course Name:** Business-Oriented Data Analytics	
Semester: VII	**Max Marks**: 100	**Weightage**: 50%

CO - Levels	CO1	CO2	CO3	CO4	CO5
Marks	14	14	24	24	24

Instructions:

(i) Read all questions carefully and answer accordingly.

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

Part A

Answer ALL the Questions. Each question carries 2marks. **10Q x 2M=20M**

1.	Define Business Analytics. Explain its role in modern decision-making.	**2 Marks**	**L2**	**CO1**
2.	What is Data Pre-processing? Discuss any two techniques with examples.	**2 Marks**	**L2**	**CO1**
3.	Differentiate between Descriptive, Diagnostic, Predictive, and Prescriptive Analytics.	**2 Marks**	**L2**	**CO2**
4.	Explain the importance of Data Quality. What are the common data quality issues?	**2 Marks**	**L3**	**CO2**
5.	What is Hypothesis Testing? Explain the concepts of Null and Alternative Hypotheses.	**2 Marks**	**L2**	**CO3**
6.	Define Correlation. Explain the difference between positive and negative correlation.	**2 Marks**	**L3**	**CO3**
7.	What is a Business Dashboard? Mention any four key features of an effective dashboard.	**2 Marks**	**L2**	**CO4**

8.	Explain the concept of Exploratory Data Analysis (EDA). Why is it required before modelling?	**2 Marks**	**L2**	**CO4**
9.	Explain the complete Data Analytics Life Cycle. Discuss each stage with suitable examples.	**2 Marks**	**L4**	**CO5**
10.	With a neat diagram, explain ETL (Extract–Transform–Load) architecture. How is ETL used in business analytics?	**2 Marks**	**L4**	**CO5**

Part B

Answer the Questions. **Total Marks 80M**

11.	**a.**	Analyze how different types of analytics (descriptive, diagnostic, predictive, and prescriptive) can be applied to a company's marketing, finance, HR, and operations data. Identify the specific insights each type can generate.	**5 Marks**	**L4**	**CO1**
	b.	Evaluate the effectiveness of using predictive analytics over descriptive analytics in business strategy formulation. Provide a justification based on accuracy, speed, and decision impact.	**5 Marks**	**L5**	**CO1**
	c.	Create an analytics framework for a business that integrates all four types of analytics. Specify the business goals, required data sources, and analytics outputs for strategic decision-making.	**10 Marks**	**L6**	**CO2**
Or					
12.	**a.**	Analyze the analytics life cycle and identify the stages where errors, delays, or data quality issues occur most frequently. Explain the impact of these issues on final business decisions	**5 Marks**	**L4**	**CO1**
	b.	Evaluate the suitability of the analytics life cycle (CRISP-DM or OSEMN) for decision-making in HR, marketing, and finance. Justify which domain benefits the most and why.	**5 Marks**	**L5**	**CO1**
	c.	Create a complete analytics life cycle model tailored for a retail company. Define all stages, key tasks, and tools required to improve business performance.	**10 Marks**	**L6**	**CO2**

13.	**a.**	Analyze a business dataset suffering from missing values, outliers, and inconsistent formats. Identify the root causes and explain how each issue may impact business decision-making.	**5 Marks**	**L4**	**CO2**
	b.	Evaluate different data cleaning and transformation strategies (imputation, scaling, encoding). Justify which techniques are most suitable for preparing the dataset for diagnostic analytics.	**5 Marks**	**L5**	**CO2**
	c.	Design a complete data-preparation workflow (pipeline) for this dataset that can be automated for future business use cases.	**10 Marks**	**L6**	**CO3**
Or					
14.	**a.**	Examine a set of business KPIs that show sudden variations during peak sales seasons. Identify possible trends, patterns, and anomalies using descriptive and diagnostic analytics.	**5 Marks**	**L4**	**CO2**
	b.	Evaluate the effectiveness of using correlation analysis, hypothesis testing, and drill-down reports to validate the root causes of the KPI changes. Justify your chosen methods.	**5 Marks**	**L5**	**CO2**
	c.	Create a dashboard blueprint showing how you would visually represent insights for top-level management. Mention chart types and layout choices.	**10 Marks**	**L6**	**CO3**

15.	**a.**	Analyze a poorly designed business dashboard and identify design flaws in terms of clutter, poor chart selection, missing KPIs, and a lack of drill-down capability.	**5 Marks**	**L5**	**CO4**
	b.	Evaluate visualization tools such as Power BI, Tableau, Excel, and Python libraries for this scenario. Justify which is best suited for redesigning the dashboard.	**5 Marks**	**L4**	**CO4**
	c.	Create a new dashboard layout with KPI hierarchy, chart choices, and interactive components that align with business decision-making needs.	**10 Marks**	**L5**	**CO4**
Or					
16.	**a.**	Analyze an organization’s full analytics lifecycle to identify gaps in data collection, processing, modelling, and insight communication.	**5 Marks**	**L4**	**CO4**

	b.	Evaluate the maturity of the organization’s analytics capability using any maturity assessment model (e.g., Gartner’s Analytics Maturity Model). Justify.	**5 Marks**	**L4**	**CO4**
	c.	Create a roadmap for transforming the organization from descriptive analytics to predictive and prescriptive analytics.	**10 Marks**	**L6**	**CO4**

17.	**a.**	Describe Business Dashboard Design Principles. Explain how dashboards support operational and executive decision-making.	**5 Marks**	**L4**	**CO5**
	b.	Analyze a given business problem where customer churn is increasing. Break down the factors affecting churn using predictive modelling concepts.	**5 Marks**	**L5**	**CO5**
	c.	Evaluate the suitability of regression, decision trees, and classification techniques for predicting churn. Justify which model is most appropriate and why.	**10 Marks**	**L6**	**CO5**
		Or			
18.	**a.**	Analyze a logistics company’s supply chain data to identify bottlenecks in transportation time, fuel cost, and route utilization using optimization analytics.	**5 Marks**	**L4**	**CO5**
	b.	Evaluate different optimization techniques (linear programming, goal seeking, simulation, scenario analysis) for improving operational efficiency. Provide a comparison.	**5 Marks**	**L5**	**CO5**
	c.	Create an optimization model outline that the company can implement to reduce delays and minimize costs. Mention the objective function, decision variables, and constraints.	**10 Marks**	**L6**	**CO5**