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**PRESIDENCY UNIVERSITY**

**Bengaluru**

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| **End - Term Examinations – JANUARY 2025** |
| **Date:** 03-01-2025 **Time:** 09:30 am – 12:30 pm |

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| --- | --- | --- |
| **School:** SOCSE | **Program:** B Tech (ISE/ISD) | |
| **Course Code:** CSE3036 | **Course Name:** Predictive Analytics | |
| **Semester**: V | **Max Marks**: 100 | **Weightage**: 50% |

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| --- | --- | --- | --- | --- |
| **CO - Levels** | **CO1** | **CO2** | **CO3** | **CO4** |
| **Marks** | **26** | **26** | **24** | **24** |

**Instructions:**

1. *Read all questions carefully and answer accordingly.*
2. *Do not write anything on the question paper other than roll number.*

**Part A**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Answer ALL the Questions. Each question carries 2marks. 10Q x 2M=20M** | | | | |
| **1** | What are some real-world case studies where predictive analytics has been successfully applied? | **2 Marks** | **L1** | **CO1** |
| **2** | Why is there growing popularity for analytics in businesses today? | **2 Marks** | **L1** | **CO1** |
| **3** | What role does predictive analytics play in improving customer experience in businesses? | **2 Marks** | **L1** | **CO1** |
| **4** | What are the limitations of predictive models such as propensity models, cluster models, and collaborative filtering? | **2 Marks** | **L1** | **CO2** |
| **5** | What is univariate statistical analysis? Provide an example of how it can be applied in predictive analytics. | **2 Marks** | **L1** | **CO2** |
| **6** | How does multivariate statistical analysis differ from univariate analysis? Explain its role in predictive modeling. | **2 Marks** | **L1** | **CO2** |
| **7** | What is overfitting, and why is it a concern in predictive modeling? | **2 Marks** | **L1** | **CO3** |
| **8** | What is the bias-variance trade-off in predictive modeling? Explain its importance in selecting the right model. | **2 Marks** | **L1** | **CO3** |
| **9** | Explain the ARIMA model and how it improves upon the ARMA model for forecasting time series data. | **2 Marks** | **L1** | **CO4** |
| **10** | What is ARFIMA, and how does it differ from ARIMA in terms of time series modeling? | **2 Marks** | **L1** | **CO4** |

**Part B**

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| **Answer the All Questions 4Q x 20M=80M.** | | | | | |
| **11.** | **a.** | **Define predictive modeling and explain the concept of propensity models with an example.** | **10 Marks** | **L2** | **CO1** |
|  | **b.** | **Explain the difference between univariate and multivariate statistical analysis. How are these techniques used in predictive analytics?** | **10 Marks** | **L3** | **CO1** |
| **or** | | | | | |
| **12.** | **a.** | **What is cluster analysis in predictive modeling? Discuss its application and limitations.** | **10 Marks** | **L2** | **CO1** |
|  | **b.** | **Discuss collaborative filtering as a technique in predictive analytics. How does it work, and what are its applications and limitations?** | **10 Marks** | **L3** | **CO1** |
|  |  |  |  |  |  |
| **13.** | **a.** | **Provide an in-depth analysis of the growing popularity of analytics in organizations. How do business leaders perceive the integration of analytics in decision-making, and what are the key barriers to adoption?** | **20 Marks** | **L2** | **CO2** |
| **or** | | | | | |
| **14.** | **a.** | **Predictive analytics has become a critical component in strategic decision-making. Discuss how it influences business strategies and long-term planning, particularly focusing on marketing, operations, and financial forecasting.** | **20 Marks** | **L2** | **CO2** |

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| **15.** | **a.** | **Describe cluster analysis and its use in predictive analytics. Explain how clustering techniques help in customer segmentation and its challenges in real-world applications.** | **20 Marks** | **L2** | **CO3** |
| **Or** | | | | | |
| **16.** | **a.** | **Analyze the role of statistical techniques such as regression and correlation analysis in predictive analytics. Provide examples of their application in business analytics and decision-making.** | **20 Marks** | **L3** | **CO3** |

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| **17.** | **a.** | **Discuss the bias-variance trade-off in detail. How does understanding this concept influence the selection of predictive models and their performance? Provide real-life examples of its application.** | **20 Marks** | **L3** | **CO4** |
| **Or** | | | | | |
| **18.** | **a.** | **Describe the Box-Jenkins methodology for time series forecasting. Walk through the steps involved in model identification, parameter estimation, and diagnostic checking.** | **20 Marks** | **L2** | **CO4** |

**\*\*\*\*\* BEST WISHES \*\*\*\*\***