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Question Paper Code:U6G02

B.E./B.Tech. DEGREE EXAMINATION, APRIL / MAY 2025

Sixth Semester

CSE (Artificial Intelligence and Machine Learning)

21UAM602- DATA AND VISUAL ANALYTICS IN AI

(Regulations 2021)

Duration: Three hours

Maximum: 100 Marks

Answer ALL Questions

PART A - (10 x 2 = 20 Marks)

1. What is information visualization? CO1- U
2. During a team meeting, a manager presents sales data and asks the team to analyze trends and suggest improvements. How would you engage in an analytical interaction to identify potential areas for growth? CO2-App
3. Define part-to-whole patterns with example. CO1- U
4. Given a company's budget and actual expenditure for a quarter, how would you use a bar chart to display deviation analysis and interpret the results? CO2-App
5. How to display distribution analysis? CO1- U
6. In a correlation matrix, you find a correlation coefficient of 0.85 between exercise hours and energy levels. How would you interpret this result, and what implications might it have for health recommendations? CO2-App
7. Define Information dashboard. CO1- U
8. How to achieve eloquence? CO1- U
9. In a website analytics dashboard, there is ample space between sections and charts. How does the use of white space improve the aesthetics and readability of the dashboard? CO2-App
10. What are the advantages of graphics? CO1- U

PART – B (5 x 16= 80 Marks)

11. (a) Apply the key features of optimal quantitative scales that ABC Manufacturing should consider when selecting scales for their data collection system. Provide specific examples of how these features can benefit the company's data analysis CO2- App (16)
- Or
- (b) Consider with a dataset containing the number of hours studied (x-axis) and exam scores (y-axis) for 1000 students. When plotted as a scatter plot, the data points are clustered, causing overplotting and making it difficult to identify trends. CO2- App (16)
- a) Describe two techniques you could use to reduce overplotting in this scatter plot while retaining the key patterns in the data.
- b) Implement one of these techniques and explain how it improves the clarity of the plot.
- c) Based on your reduced-overplotting plot, interpret the relationship between the number of hours studied and exam scores, and describe any trends you can observe.
12. (a) Explain the methods of deviation analysis and the charts that involved to display the deviation analysis. CO1- U (16)
- Or
- (b) Discuss the types of maps, such as heat maps, flow maps, and dot maps, that can enhance time series displays. For each map type, explain how it can be used to visualize the evolution of data over time. Provide a real-world example for each map type and discuss how the choice of map enhances the interpretation of temporal trends. CO1- U (16)
13. (a) Apply histogram analysis to identify the shape of a dataset's distribution and interpret its characteristics. CO2- App (16)
- Or
- (b) Apply multivariate analysis to identify the relationship between income, education, and job satisfaction. CO2- App (16)
14. (a) Explain the importance of user-centered design in the creation of information dashboards. Why is it crucial to understand the target audience when designing a dashboard? CO1- U (16)

Or

- (b) Explain the potential challenges and benefits of using a heatmap to visually encode data on a dashboard. CO1- U (16)
15. (a) An environmental monitoring dashboard displays live satellite images of weather patterns. The dashboard slows down significantly when handling high-resolution images. How would you optimize the media display to balance image quality and system performance? CO2- App (16)
- Or
- (b) Apply a library of graphics to customize the visual style of a marketing campaign's presentation. CO2- App (16)

