

Reg No.: _____

Name: _____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY
B.Tech Degree S5 (S,FE) Examinations June 2026 (2019 Scheme)

Course Code: AMT301

Course Name: DATA HANDLING AND VISUALIZATION

Max. Marks: 100

Duration: 3 Hours

PART A

(Answer all questions; each question carries 3 marks)

Marks

- | | | |
|----|--|---|
| 1 | Define the need and purpose of data visualization. | 3 |
| 2 | What is external representation in data visualization, and why is it important? | 3 |
| 3 | Explain the difference between scalar fields and vector fields. | 3 |
| 4 | Summarize matrix views and network connections in the context of network and tree arrangement. | 3 |
| 5 | What is the purpose of the par() function in R? Explain how it can be used to customize plots with an example. | 3 |
| 6 | Define a data frame in R and explain how it differs from a matrix. | 3 |
| 7 | What is a bar plot, and what types of data is it typically used to represent? | 3 |
| 8 | Explain the concept of a tree map and provide an example of its application. | 3 |
| 9 | Explain the roles of firewall logs and intrusion detection logs in network security. | 3 |
| 10 | Describe the main objectives of a vulnerability assessment. | 3 |

PART B

(Answer one full question from each module, each question carries 14 marks)

Module -1

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|----|--|---|
| 11 | a) Discuss the significance of marks and channels in data visualization. | 7 |
| | b) Explain the concept of task abstraction in data visualization and provide examples of different tasks. | 7 |
| 12 | a) List and describe common data visualization tools available today. What are their key functionalities? | 7 |
| | b) Explain the concept of data abstraction and its significance in data visualization. What are the different dataset types, and how do they affect visualization? | 7 |

Module -2

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|----|---|----|
| 13 | a) Write the differences between spatial layout density and spatial axis orientation. How do both contribute to effective data visualization? | 10 |
|----|---|----|

- b) What are the main principles of color theory used in map color visualization? 4
- 14 a) Describe the role of connections and matrix views in representing complex networks. What are their advantages and challenges? 6
- b) Describe color mapping. Explain the different types of color maps. 8

Module -3

- 15 a) Explain the difference between numeric, character, and logical data types in R. Provide an example of each data type. 4
- b) Describe the apply, lapply, sapply, and tapply functions in R. Discuss their differences with examples. 10
- 16 a) Write an R function to calculate area and perimeter of a rectangle. Provide an example of how to call this function. 4
- b) Discuss the use of control flow statements in R. Explain with examples. 10

Module -4

- 17 a) What are the differences between an interactive scatter plot and a traditional scatter plot. Write the R codes for each. Discuss the advantages and disadvantages of each in terms of data interpretation. 10
- b) Define a dendrogram and explain its significance in hierarchical clustering. 4
- 18 a) Describe about Histogram. Write the R code to merge two Histograms. 7
- b) Describe the role of color in heat maps and dendrograms with detailed description. Write the R code to construct a heat map. 7

Module -5

- 19 a) Explain about the Port scan visualization system. 7
- b) Describe link graphs. 7
- 20 a) Discuss in details Attacking and defending visualization. 10
- b) Explain the purpose of creating a security visualization system. 4
