

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY GURAJADA VIZIANAGARAM
IV B. Tech I Semester Regular/Supplementary Examinations October 2025
SOCIAL NETWORK ANALYSIS

(AI&DS, AI&ML, CSE(AI&DS), CSE(AI&ML), CSE(AI), CSE(DATA SCIENCE))

Time: 3 hours

Max. Marks: 70

Answer any **FIVE** Questions **ONE** Question from **Each unit**

All Questions Carry Equal Marks

UNIT-I

1. a) What is the Erdos Number Project and what does it signify? [7M]
- b) Design a simple social network diagram to illustrate structural balance among three individuals. [7M]

(OR)

2. a) Define balance theory and homophily. Give an example for each. [7M]
- b) Compare between ness centrality and eigenvector centrality using a small network example. [7M]

UNIT-II

3. a) Describe the relationship between social media and big data. [7M]
- b) What are models of network growth? Give examples. [7M]

(OR)

4. a) Describe multidimensional scaling (MDS) and its use in network visualization. [7M]
- b) Evaluate the advantages and limitations of random graph models in capturing real social patterns. [7M]

UNIT-III

5. a) Define network topology and describe its characteristics. [7M]
- b) Analyze how network clustering affects the spread of innovations? [7M]

(OR)

6. a) Discuss factors influencing diffusion speed in social systems. [7M]
- b) Describe how information navigates through a network. [7M]

UNIT-IV

7. a) Define the small-world phenomenon and describe Milgram's experiment. [7M]
- b) What are heavy-tailed distributions in networks? [7M]

(OR)

8. a) Describe the Erdos-Rényi model and its relevance to small-world properties. [7M]
- b) Compare random graphs and small-world models in terms of degree distribution and clustering. [7M]

UNIT-V

9. a) Explain the PageRank algorithm and its iterative computation process. [7M]
- b) What is coloring in networks? Give an example. [7M]

(OR)

10. a) Explain spatial and agent-based models in social network studies. [7M]
- b) Evaluate the impact of behavioral experiments on understanding network decision-making? [7M]
