

Code No: P5802/19

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY-GURAJADA VIZINAGARAM

M. Tech. III Semester Regular/Supplementary Examinations, December-2025

**Social Network Analysis**  
**COMPUTER SCIENCE & ENGINEERING (58)**

Time: 3 Hours

Max. Marks: 75

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*Answer any FIVE Questions One Question from Each Unit*  
*All Questions Carry Equal Marks*

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**UNIT-I**

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|----|---|---|----|
| 1. | a | What are centrality measures in SNA? Explain the different types with examples. | 8M |
|    | b | Discuss briefly about homophily in social networks?                             | 7M |

**OR**

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|----|---|--|----|
| 2. | a | Compare and contrast centrality, balance in Social Network Analysis. | 8M |
|    | b | Describe the Erdos Number Project and its significance?              | 7M |

**UNIT-II**

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|----|---|---|----|
| 3. | a | Explain about random graph models in detail.  | 8M |
|    | b | What is navigation in social networks? Discuss the mechanisms that enable efficient search and information routing. | 7M |

**OR**

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|----|---|---|----|
| 4. | a | Explain Multidimensional Scaling (MDS) and its role in visualization and analysis of social networks. | 8M |
|    | b | What is structural equivalence? how to measure structural equivalence.                                | 7M |

**UNIT-III**

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|----|---|---|----|
| 5. | a | Explain how network topology influences diffusion processes in social networks. | 8M |
|    | b | Describe the concept of contagion in networks.                                  | 7M |

**OR**

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|----|---|---|----|
| 6. | a | What is complex contagion? Compare simple and complex contagion with suitable examples. | 8M |
|    | b | Discuss percolation theory and its relevance to information diffusion in networks?      | 7M |

**UNIT-IV**

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|----|---|--|----|
| 7. | a | Describe small-world models and explain how they capture the structure of real-world networks. | 8M |
|    | b | Explain briefly about clustering in networks?  | 7M |

**OR**

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|----|---|--|----|
| 8. | a | Discuss briefly about the Erdős–Rényi model ?            | 8M |
|    | b | Explain the significance of the small-world experiments. | 7M |

**UNIT-V**

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|----|---|---|----|
| 9. | a | Explain the concept of important vertices in network structure. How does the PageRank algorithm identify influential nodes? | 8M |
|    | b | Discuss the basics of game theory and its relevance to networked interactions.  | 7M |

**OR**

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|-----|---|---|----|
| 10. | a | Discuss the use of behavioral experiments, spatial models in studying network dynamics.                                       | 8M |
|     | b | Describe the idea of rational dynamics in networks. How do individuals' rational decisions influence global network behavior? | 7M |