20SSP56

PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)

MSc (SS) DEGREE EXAMINATION DECEMBER 2025
(Ninth Semester)

Branch – **SOFTWARE SYSTEMS (five years integrated)**

SOCIAL NETWORK ANALYSIS

Time: Three Hours Maximum: 50 Marks

SECTION-A (5 Marks)
Answer **ALL** questions
ALL questions carry **EQUAL** marks (5 x 1 = 5)

1 Which of the following tools is widely used for visualizing large-scale network data?
(i) Tableau (ii) Gephi
(iii) Tensorflow (iv) Excel

2 What does the concept of homophily in social networks refers to?
(i) The tendency to form ties with dissimilar individuals
(ii) The process of removing weak ties from a network
(iii) The tendency of individuals to associate with similar others
(iv) The structural balance between network components

3 What does the preferential attachment model describe?
(i) The uniform distribution of connections in a network
(ii) Random formation of links between nodes
(iii) Growth of networks where new nodes connect to already well-connected nodes
(iv) The removal of weak ties in dynamic networks

4 Which concept states that a network's value grows as more people join?
(i) Moore's Law (ii) Metcalfe's Law
(iii) Pareto Principle (iv) Nash Equilibrium

5 Which method does spectral clustering in graph mining mainly use?
(i) Degree centrality
(ii) Eigenvalues and eigenvectors of the graph Laplacian
(iii) Random number generation
(iv) Tree-based partitioning

SECTION - B (15 Marks)
Answer **ALL** Questions
ALL Questions Carry **EQUAL** Marks (5 x 3 = 15)

6 a State and explain any three sources from which network data can be obtained.
OR
b Explain the main differences between directed and undirected networks.

7 a Justify any two types of centrality measures used in network analysis.
OR
b Differentiate between strong ties and weak ties with suitable examples.

8 a Illustrate about information diffusion with real-world example.
OR
b Analyze the cascading behavior on networks with an example.

Cont...

9 a Explain how network economics differs from traditional economics?

OR

b Analyze the bargaining power in networks with an example.

10 a Explain graph mining. State its main applications in data analysis.

OR

b Apply the concept of community detection with a real world example.

SECTION -C (30 Marks)

Answer **ALL** questions

ALL questions carry **EQUAL** Marks (5 x 6 = 30)

11 a Describe in detail the process of visualizing network data using Gephi with example.

OR

b Explain the fundamentals of graph theory relevant to network data analysis.

12 a Assess the different notions of centrality in social network analysis. How do these measures help in identifying key influencers?

OR

b Examine the concept of structural balance in social networks. Illustrate how balanced and unbalanced triads influence social dynamics and network stability.

13 a Interpret how information diffusion occurs in social networks. Explain the factors that affect the rate and reach of diffusion.

OR

b Evaluate the relation between network structure and the spread of contagion or information.

14 a Analyze how do centrality and connectivity affect negotiation strength among nodes.

OR

b Enumerate the working of sponsored search markets in networks.

15 a Explain how random walks and spectral methods are used in mining graphs?

OR

b Elaborate the concept of link analysis for web mining.

Z-Z-Z END