JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST -3 EXAMINATION- 2024

M.TECH-II Semester (Data Science)

COURSE CODE(CREDITS): 22M1WCI234 (2) MAX. MARKS: 35

COURSE NAME: Social and Information Network Analysis

COURSE INSTRUCTORS: MS. SEEMA RANI MAX. TIME: 2 Hours

Note: (a)All questions are compulsory.

(b)Marks are indicated against each question in square brackets.

(c) The candidate is allowed to make Suitable numeric assumptions wherever required for solving problems

1. Explain the contexts in which the SIENA (Stochastic Actor-Oriented Models) and Exponential Random Graph Models (ERGMs) are utilized in social network analysis? [C0-6][6M]
2. Calculate the Degree Centrality, Eccentricity, Radius, and Closeness for the given graph with the following edge weights: PQ: 2, PR: 4, QR: 2, QS: 7, RS: 3. [C0-4][6 M]
3. Illustrate the process of social network analysis using different tools. [CO-4][5M]
4. Find the Eigenvector Centrality of the following of matrix $A = \begin{bmatrix} -5 & 2 \\ 2 & -2 \end{bmatrix}$. Compute eigenvalue, principal eigenvalue and eigenvectors. [C06][6M]
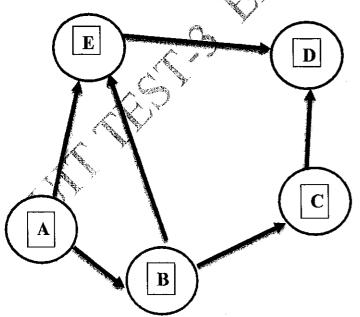5. What is Monadic Hypothesis test and its calculation methods, supplemented with an illustrative example. [CO-5][4M]
6. Outline the algorithm for calculating Eigenvector Centrality. [CO-2,3][3 M]
7. What do you mean by betweenness centrality of directed connected graph? Compute the betweenness centrality of node B and E. [CO-6][5M]