

Register Number

**Sri Sivasubramaniya Nadar College of Engineering, Kalavakkam – 603 110**  
 (An Autonomous Institution, Affiliated to Anna University, Chennai)

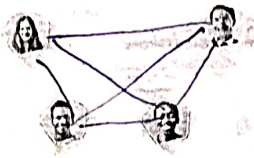
**Department of Computer Science and Engineering**

**Continuous Assessment Test – I**

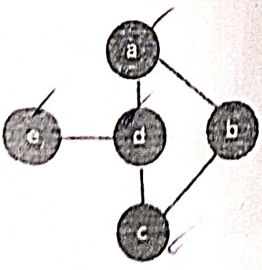
**Question Paper**

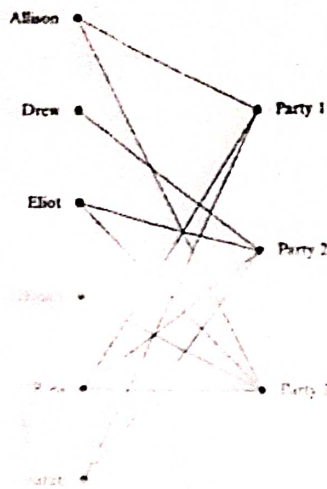
Degree & Branch	B.E., Computer Science & Engineering				Semester	7
Subject Code & Name	UCS1722 - SOCIAL NETWORK ANALYSIS				Regulation:	2018
Academic Year	2022 – 2023 ODD	Batch	2019 - 2023	Date	21.09.22	FN
Time: 8:15 – 9:45am (90 Minutes)	Answer All Questions				Maximum: 50 Marks	

**Part – A (6×2 = 12 Marks)**


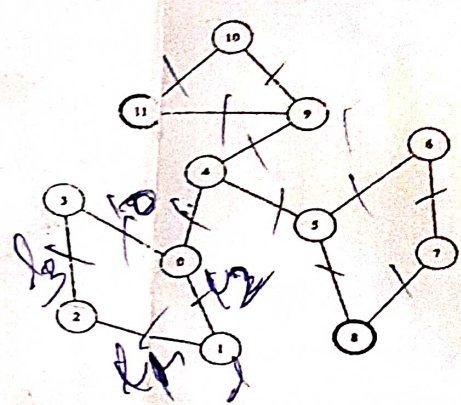
KL1	1. What is Social Network Analysis?	CO1
KL1	2. What are the different kinds of global structures of social networks?	CO1
KL3	3. Apply the social network concepts to find the degree centrality of the nodes in the given network. 	CO1
KL3	4. Assume a network of 20 countries that shares common borders between them. Identify whether the network is a directed or non-directed network and find out the maximum possible borders that can exist between the countries.	CO1
KL1	5. What are signed graphs?	CO2
KL1	6. What is the significance in applying matrix permutation to social network?	CO2

**Part – B (3×6 = 18 Marks)**

KL2	7. Explain the different graph models for social networks and their pros and cons.	CO1
KL3	8. Apply the social network concepts to find the betweenness centrality and closeness centrality measures for all the nodes in the network given below. 	CO1
KL3	9. Build one-mode affiliation network for the given two-mode affiliation network, where the actors are children and the events are the birthday parties they attended.	CO1



**Part – C (2×10 = 20 Marks)**

KL2	10. Explain the different dimensions of Social Capital by Nahapiet and Ghoshal.	CO1
(OR)		
KL2	11. Explain the data collection complexities in social networks and detail the alternatives.	CO1
	12. Apply the appropriate matrix operations for the network shown below and find the following measures.	
KL3	 <p>a) Distance/connectivity matrix b) Geodesic of length 2 c) Indegrees of nodes d) Outdegrees of nodes e) Density of the network</p>	CO2
(OR)		
KL3	<p>13. Apply the graph theory concepts for social networks and find the following measures for the network shown below.</p> <ol style="list-style-type: none"> <li>1. Eccentricity of Node3 .</li> <li>2. A Walk</li> <li>3. A Trail</li> <li>4. Tour in the graph</li> <li>5. Nodal degree of all nodes</li> <li>6. Mean nodal degree</li> <li>7. Variance of degree</li> <li>8. Density of the graph</li> <li>9. Cut-Point or node connectivity</li> <li>10. Edge connectivity</li> </ol> 	CO2



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**Computer Science and Engineering**

**Continuous Assessment Test – III**

**Question Paper**

Degree & Branch	B.E. Computer Science and Engineering				Semester	7
Subject Code & Name	UCS 1722 Social Network Analysis				Regulation:	2018
Academic Year	2022-2023 ODD	Batch	2019 - 2023	Date	17.11.22	FN
Time: 08:15 – 09:45 a.m (90 Minutes)	Answer All Questions				Maximum: 50 Marks	

**Part – A (6×2 = 12 Marks)**

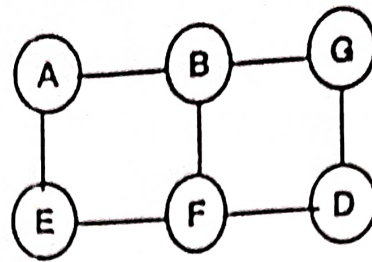
KL1	1. What is meant by triadic analysis?	CO4
KL3	2. Identify the significance of the forbidden triads in a social network.	CO4
KL2	3. How does visualization help in social network analysis?	CO5
KL1	4. Which kind of network is suited for matrix-based visualization?	CO5
KL3	5. Compare the functionalities of the 3 most popular centrality measures used in social network analysis.	CO5
KL1	6. List the advantages of Node-Link Diagrams.	CO5

**Part – B (3×6 = 18 Marks)**

KL2	7. Explain the various kinds of Node-Edge diagrams used for social network visualizations	CO5
KL3	8. Identify the similarities and dissimilarities in the functionalities of user-centric, content-centric and hybrid visualization.	CO5
KL4	9. Distinguish between matrix based and node-link based diagrams.	CO5

**Part – C (2×10 = 20 Marks)**

KL2	10. Discuss the different solutions that could be used to make visualization in readable form when scaling to larger networks	CO5
(OR)		
KL2	11. Explain how the combination of matrix and node link diagrams is leveraged for better visualization.	CO5
KL3	12. Analyze and explain the process of how Girvan-Newman algorithm is applied to the below network for detecting the communities.	CO5

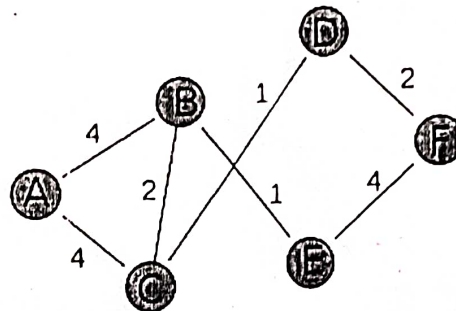


(OR)

13 a. Apply Node-link based visualization technique to draw the below network using NetworkX code as a labelled weighted graph. Node's colors should be in red and the link's colors should be in blue. Use spring layout for positioning.

b. Write an algorithm to perform an appropriate traversal to analyze a person's network connection at a deeper level. Using NetworkX command implement the traversal method and display the list of nodes in the order it was visited.

KL3



CO5



Register Number 1950013014

**Sri Sivasubramaniya Nadar College of Engineering, Kalavakkam – 603 110**  
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**Department of Computer Science and Engineering**  
**Continuous Assessment Test – II**  
**Question Paper**

Degree & Branch	B.E. Computer Science & Engineering				Semester	7
Subject Code & Name	UCS1722 – Social Network Analysis				Regulation:	2018
Academic Year	2022 – 2023 ODD	Batch	2019 - 2023	Date	19.10.2022	FN
Time: 08:15 – 09:45 a.m (90 Minutes)	Answer All Questions				Maximum: 50 Marks	

**Part – A (6×2 = 12 Marks)**

KL1	1. List any four examples of non-directional relations in social network.	CO2
KL3	2. What kind of social network analysis can be performed for a scenario where “children playing together” ?	CO2
KL1	4. Why detecting communities in a social network is important.	CO3
KL1	5. What is the rewritten form of the formula for the modularity of Newman and Girivan and write down what each term refers to ?	CO3
KL4	6. Distinguish between optimization-based and heuristics-based algorithms for solving Network Community Mining Problems in Social Networks.	CO3
KL3	3. Develop a NetworkX code to remove nodes with degree > 2 from the network.	CO4

**Part – B (3×6 = 18 Marks)**

KL2	7. Explain three categories of definitions for communities.	CO3
KL3	8. Evaluate the quality of the communities in social networks using Newman-Girivan’s formula.	CO3
KL4	9. Examine how network community mining algorithms finds the communities in a network using heuristic approach.	CO4

**Part – C (2×10 = 20 Marks)**

KL2	10. Explain the various optimization-based algorithms for detecting the communities in social networks.	CO3
(OR)		
KL2	11. Explain any three applications of community mining algorithms.	CO3



KL4	<p>12. Assume there is a large community-based network. A researcher wants to analyze the network based on certain criteria of interest. But he is clueless where to start.</p> <ol style="list-style-type: none"> <li>What are the different types of approaches he should follow to simplify the network for analysis</li> <li>Write the NetworkX code for any one of the approaches that reduces the network size.</li> <li>Suggest different ways to find the most influential node in the network.</li> <li>Justify why a node with less degree is still a popular node in the network.</li> </ol>	CO4
(OR)		
KL4	<p>13. Consider an API that retrieves the connection information between a particular user and his friends circle at several levels in a social network. The connections are directional and are in the following format.</p> <p style="text-align: center;">Alice &gt; bob Dave &lt; Alice Carol &gt; Alice</p> <ol style="list-style-type: none"> <li>Write a NetworkX code to draw an Ego network for "Alice" at friend-of-friend-of-friend degree level</li> <li>For the same network, write a NetworkX code to perform data collection using snowball sampling.</li> </ol>	CO4

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