

MANIPAL INSTITUTE OF TECHNOLOGY

(A constituent unit of MAHE, Manipal)

VII SEMESTER B.TECH. (COMPUTER SCIENCE & ENGINEERING) END SEMESTER MAKEUP EXAMINATIONS, JANUARY 2020

SUBJECT: SOCIAL NETWORK ANALYSIS [CSE 4012]

REVISED CREDIT SYSTEM (02/01/2020)

Time: 3 Hours

MAX. MARKS: 50

Instructions to Candidates:

- ✤ Answer ALL the questions.
- Missing data may be suitably assumed.
- 1A. For the given adjacency list in Table 1A, answer the following questions
 - i) Draw the 1 and 1.5 degree egocentric networks with respect to node E.
 - ii) Define clique. Identify and draw the largest clique in the given network of nodes.
 - iii) Perform the degree distribution of the graph and graphically represent the same.
 - iv) Calculate the density of the given network.

A	B,F,E
В	A,E
С	D,E,G,F
D	C,E
E	B,C,F,G,D
F	A,C,G,E
G	C,E,F

Table 1A

- **1B.** Define betweenness centrality and closeness centrality. For the given adjacency list in Table 1A, (4M) calculate the betweenness centrality of node A and E with necessary steps.
- **1C.** Explain degree centrality with an example.

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(4M)

(2M)

2A.	i)	Differentiate regular graph and random graph with an example for each.	(4M)		
	11)	coefficient of node E for the network given in Table 1A.			
2B.	2B. Explain the need for graph simplification. Discuss the two different techniques for graph simplification.				
2C.	Differentiate agglomerative and divisive algorithm. Explain with appropriate example.				
3A.	• Explain circular layout and force directed layout with an example for each.				
3B.	Defin propa	e network propagation in social networks. Explain how tie strength is related to network gation. Explain graph simplification with an example.	(4M)		
3C.	What	affects the phenomenon of homophily?	(3M)		

- 4A. Consider the snapshot of Employee data for the year 2019 shown in Table 4A. In total there are 198 (5M)unique IDs generated by the computer and is assigned on first come first serve basis. Assume u as 0.5, 0.7 and 0.6 for First Name, Last Name and Salary. Assume m probability as 0.98 for all attributes. Assume no partial match.
 - i) Calculate u for Joining Date and ID
 - ii) Calculate w_{match} and w_{nonmatch} for all attributes
 - iii) Calculate the score for all pairs
 - iv) Identify the most overlapping pair

Table 4A							
First							
Name	Last Name	Joining Date	Salary	ID			
Riya	Das	06-01-2019	5000	89			
Akshay	Kumar	07-04-2019	6700	78			
Akshay	Kiran	13-08-2019	6700	45			
Riya	D	12-10-2019	5000	12			

- **4B**. Write a note on influence related statistics.
- **4C**. Write a note on social influence in health care and influence and friendship drift, explain with (2M) example.
- Give the properties of a blogger. 5A.
- **5B**. Write a note on:
 - i) Diffusion Influence model
 - ii) Linear threshold model
 - iii) General Cascade model
- 5C. Differentiate edge betweeness and node betweeness. Calculate the edge betweeness with respect to (3M)edges BE, BG, BC and AC for the graph in Figure 5C.



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(3M)

(3M)

(4M)