Reg.No.										

MANIPAL INSTITUTE OF TECHNOLOGY
MANIPAL
(A constituent unit of MAHE, Manipal)

VII SEMESTER B.TECH. (COMPUTER SCIENCE & ENGINEERING)
MAKEUP EXAMINATION, FEBRUARY 2022

SUBJECT: SOCIAL NETWORK ANALYSIS [CSE 4074]

REVISED CREDIT SYSTEM

17/02/2022 [Online]

Time: 75 Minutes **MAX. MARKS: 20M**

Instructions to Candidates:

- Answer **ALL** the questions.
- Missing data may be suitably assumed.

PART-B: Descriptive Questions

1A. Consider you are provided with Eigen values lambda λ and Eigen vectors x of the Laplacian matrix L, then identify the algorithm that can be used to discover communities in a network? Also, define compute the Laplacian matrix and its normalized version for the graph given in Fig.1A. (5M)

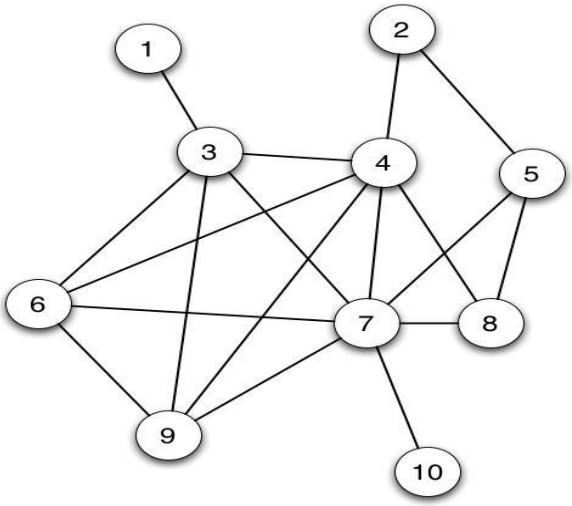

Fig.1A.

1B. Apply Normalized Cut technique for the graph given in Fig.1B and compute the NCut(C1,C2) of graph, where cut is shown in Orange coloured bold line. Also, justify how two communities can be discovered using the computed results. (3M)

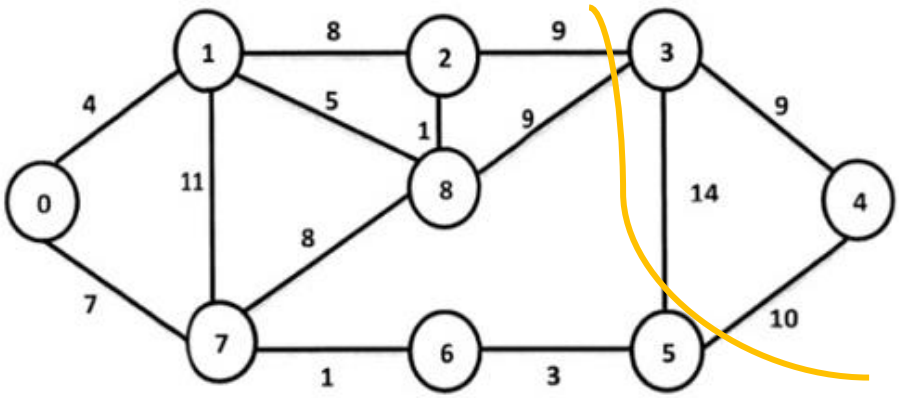

Fig.1B.

1C. Consider you are given a responsibility of developing a Team collaboration application (such as 'Microsoft Teams') having data covering roughly 1,00,000 users and analyse its performance aspects. During analysis, how will you identify homophily existing in this network and also specify the critical issues of homophily identification process. (2M)

2A. For the network given in Fig.2A compute link prediction scores using Common neighbor, Jaccard Index, Adamic/ Adar and Preferential Attachment techniques. Also, predict **Two** most likely new edges for the given network based on each of the prediction scores. (5M)

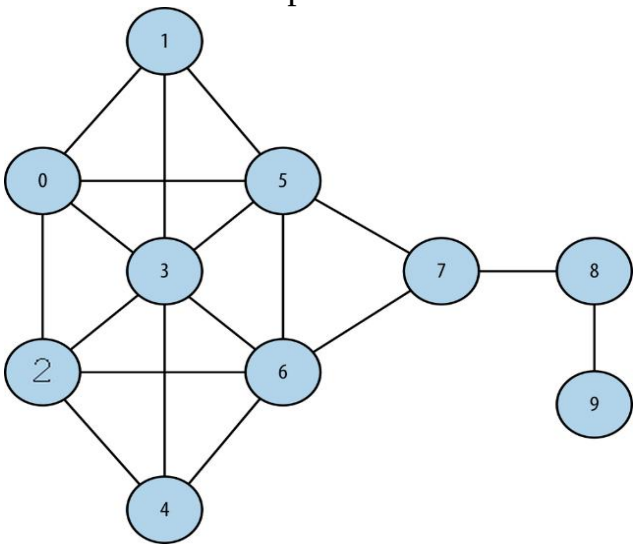

Fig.2A.

2B. Consider the graph given in Fig.2B, identify the existence of Local bridge(s) if any and justify your answers with atleast two reasons for selecting as local bridges? (3M)

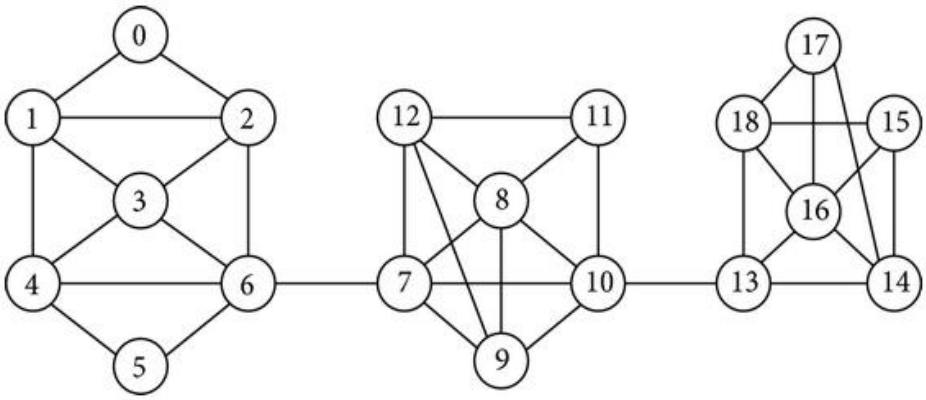

Fig.2B.

2C. Why Grouping behaviour analysis is important in social networks? Analyze the mainly focused queries and different factors which influence the dynamics of grouping behaviors in diverse online forums? (2M)

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