

MANIPAL INSTITUTE OF TECHNOLOGY MANIPAL

VII SEMESTER B.TECH. (COMPUTER SCIENCE AND ENGINEERING) **END EXAMINATIONS, NOV/DEC 2018**

SUBJECT: GRAPH ANALYTICS FOR BIG DATA [CRA 4008]

REVISED CREDIT SYSTEM (01/12/2018)

Time: 3 Hours

MAX. MARKS: 50

Instructions to Candidates:

- ✤ Answer ALL the questions.
- ✤ Missing data may be suitably assumed.
- **1A.** Explain the impact of Big Data's three V's on Graphs using an example for each?
- **1B.** Explain graph analytics for big data using human information network as an example.
- Draw the graph network for "College" with the following description: 2A.
 - "Harry" and "Cherry" are co-workers
 - "Larry" and "Barry" are classmates and taught by "Harry"

Assuming node type as "CollegeNode" and edge type as "CollegeRelation", write the technical text description of the graph and actual CYPHER code to create the "College" network.

- **2B.** Consider the graph network described in Q.2.A, perform the following operations using CYPHER code to:
 - Add a new node for "Sherry" who is a newly joined student to a course taught by "Cherry".
 - Find the degree of all nodes
 - Find the shortest path from "Harry" to "Sherry" •
 - Construct the Normalized Laplacian Matrix of the graph
- **3A.** Explain how graph analytics is being used in twitter.
- Define Diameter of a Graph. Find the diameter of the two graphs: Fig Q3B.1 & Fig Q Q3b.2 3M 3B.





3C. What is a Multigraph? Give an example.

2M

5M

5M

5M

5M

5M

4A. Compute the Betweenness Centrality for each node in Graph [FigQ4A.1] and find the most **5M** central node with the above computation.



4B.	FigQ4A.1 Compare Centrality and Centralization in a Graph with an example	3М
4C.	Define the following terms: i)Path Analytics ii)Connectivity Analytics iii)Community Analytics iv)Centrality Analytics	2M
5A.	Write the Google's page rank code and explain how it computes Node Centrality?	5M
5B.	List and describe the two large scale graph processing systems	3M
5C.	Describe the two versions of Key Player Problem with example.	2M
