BE/VIII/Big Data Analysis/CBSGS/08/05/2018 Comp. **Q.P.Code: 40458**

(3 Hours) **[Total Marks 80]**

i. **Q. 1. is Compulsory.**
ii. **Attempt any three from the remaining.**
iii. **Assume suitable data.**

Q. 1 **(a)** Explain what characteristics of Social Networks make it Big Data. **(5)**

(b) What do you mean by Jaccard Similarity? Illustrate with an example. Describe any two applications that can use Jaccard Similarity. **(5)**

(c) Define concept of a **Link Farm** using a diagram. How does it lead to Link Spam? **(5)**

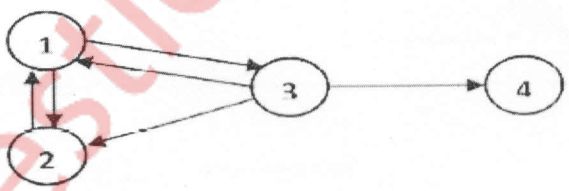
(d) What are the challenges of querying on large Data Streams? **(5)**

Q. 2 **(a)** What do you understand by BASE properties in NOSQL Database? Explain in detail any one NOSQL architecture pattern. Identify two applications that can use this pattern. **(10)**

(b) Write Map Reduce Pseudocode to multiply two matrices. Illustrate the procedure on the following matrices. Clearly show all the steps. **(10)**

$$A = \begin{bmatrix} 1 & 2 \\ 2 & 1 \\ 3 & 4 \end{bmatrix} \quad B = \begin{bmatrix} 1 & 2 \\ 1 & 3 \end{bmatrix}$$

Q. 3 **(a)** For the graph given below show the page ranks of all the nodes after running the PageRank algorithm for two iterations with teleportation factor with Beta (β) value = 0.8 **(10)**



(b) Give two applications for counting the number of 1's in a long stream of binary values. Using a stream of binary digits, illustrate how the DGIM algorithm will find the number of 1's. **(10)**

Q. 4 **(a)** What do you mean by the Hadoop Ecosystem? Describe any three components of a typical Hadoop Ecosystem. **(10)**

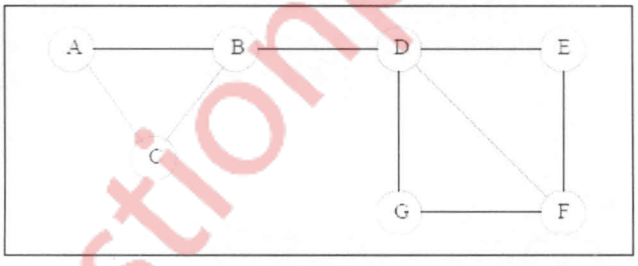
(b) Explain the following concepts with respect to world wide web **(10)**
A. Topic Specific Page Rank
B. Bowtie structure of the Web

Q. 5 **(a)** Explain the design of a recommender system used to recommend movies to users. The recommender system should use Collaborative filtering. **(10)**

(b) Explain the CURE algorithm for clustering large datasets. Please illustrate the algorithm using appropriate figures. **(10)**

Q. 6 **(a)** Explain the SON algorithm for Frequent Pattern mining. Illustrate how Map Reduce can be used for implementing this algorithm **(10)**

(b) What is a "Community" in a Social Network Graph? For the following graph show how the Girvan Newman algorithm finds the different communities. **(10)**



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