(3 Hours) Max. Marks**: 80**

N. B: 1. Question **ONE** is compulsory.
2. Attempt any **THREE** out of remaining.
3. **Figures** to the **right** indicate **full** marks.
4. Assume suitable data if **necessary**.

Qu-1	**a)**	What are the characteristics of big Data?	**5**
	b)	Explain Hadoop Architectural Model.	**5**
	c)	List the different issues and challenges in data stream query processing.	**5**
	d)	Explain NoSQL data Architecture patterns.	**5**
Qu-2	**a)**	Explain DGIM algorithm for counting ones in a stream with example.	**10**
	b)	Explain Social Network graph clustering algorithm with example.	**10**
Qu-3	**a)**	Explain Model for Recommendation System in detail	**10**
	b)	Explain Matrix - Matrix Multiplication using TWO step MapReduce model.	**10**
Qu-4	**a)**	Explain PageRank algorithm with suitable example.	**10**
	b)	Explain Bloom's filter for stream data mining with example.	**10**
Qu-5	**a)**	Explain PCY algorithm with suitable example.	**10**
	b)	i) Find Jaccard distance {1, 2, 3, 4} &{2, 3, 5, 7} and {a, a, a, b}& {a, a, b, b, c} ii) Find Hamming Distance between 110011 & 010101 and 11001 & 01011 iii) Compute the cosines of the angles between (3,−1, 2) and (−2, 3, 1).	**10**
Qu-6		Write a note on	**20**
	a)	Hadoop Ecosystem	
	b)	CURE Algorithm	
	c)	HITS	
	d)	MapReduce programming model	
