Time: 03 Hours **Marks: 80**

Note: 1. Question 1 is compulsory
2. Answer any three out of the remaining five questions.
3. Assume any suitable data wherever required and justify the same.

Q1 a) What is function of Map Tasks in the Map Reduce framework? Explain with the help of an example. [5]

b) Demonstrate how business problems have been successfully solved faster, cheaper and more effectively considering NoSQL Google's MapReduce case study. Also illustrate the business drivers and the findings in it. [5]

c) Why is HDFS more suited for applications having large datasets and not when there are small files? Elaborate. [5]

d) Explain the concept of bloom filter with an example [5]

Q2 a) Name the three ways that resources can be shared between computer systems. Name the architecture used in big data solutions and describe it in detail. [10]

b) Write a map reduce pseudo code for word count problem. Apply map reduce working on the following document: [10]

"This is an apple. Apple is red in color".

Q3 a) Suppose the stream is 1, 3, 2, 1, 2, 3, 4, 3, 1, 2, 3, 1. Let h(x) = 6x + 1 mod 5. Show how the Flajolet- Martin algorithm will estimate the number of distinct elements in this stream. [10]

b) Consider the following data frame given below: [10]

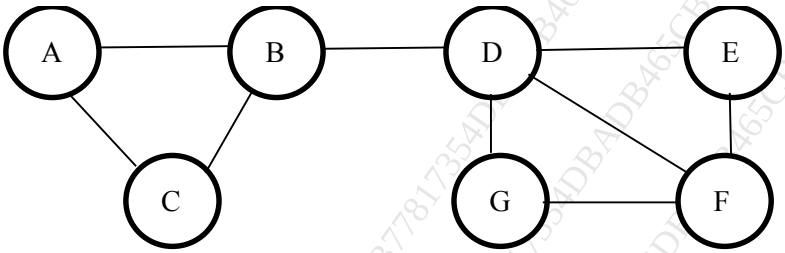
subject	class	marks
1	1	56
2	2	75
3	1	48
4	2	69
5	1	84
6	2	53

i. Create a subset of subject less than 4 by using subset () function and demonstrate the output.
ii. Create a subset where the subject column is less than 3 and the class equals to 2 by using [ ] brackets and demonstrate the output.

Q4 a) What are the Core Hadoop components? Explain in detail. [10]

b) With a neat sketch, explain the architecture of the data-stream management system. [10]

Q5 a) Determine communities for the given social network graph using Girvan- Newman algorithm. [10]



b) The data analyst of Argon technology Mr. John needs to enter the salaries of 10 employees in R. The salaries of the employees are given in the following table: [10]

Sr. No.	Name of employees	Salaries
1	Vivek	21000
2	Karan	55000
3	James	67000
4	Soham	50000
5	Renu	54000
6	Farah	40000
7	Hetal	30000
8	Mary	70000
9	Ganesh	20000
10	Krish	15000

i. Which R command will Mr. John use to enter these values demonstrate the output.
ii. Now Mr. John wants to add the salaries of 5 new employees in the existing table, which command he will use to join datasets with new values in R. Demonstrate the output.

Q6 a) i. Write the script to sort the values contained in the following vector in ascending order and descending order: (23, 45, 10, 34, 89, 20, 67, 99). Demonstrate the output. [10]
ii. Name and explain the operators used to form data subsets in R.

b) How recommendation is done based on properties of product? Elaborate with a suitable example. [10]
