BE(Comp.) sem VII R-19 C-scheme 04/06/25

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) Mention four characteristics of big data and explain in detail. [5]

b) Explain Shuffle & Sort phase and Reducer phase in Map Reduce. [5]

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

d) List down all six constraints that must be satisfied for representing a stream by buckets using DGIM algorithm with examples. [5]

Q2 a) The project manager at XYZ Ltd., Ms. Meera, is responsible for maintaining details of all active projects. She has organized the project information in the following table: [10]

Project Id	Project Name	Budget	Status
1	CRM Implementation	120000	In Progress
2	Cloud Infrastructure	180000	Completed
3	Network Upgrade	60000	Not Started
4	E-Commerce Platform	220000	Completed
5	Data Analytics	90000	In Progress

i) Create a Data frame in R for the above project data and display the output.

ii) Ms. Meera has recently approved 2 new projects and wants to add their information. The new projects are as follows:

Project Id	Project Name	Budget	Status
6	UX Research	160000	Not Started
7	Cloud Integration	190000	Not Started

Update the Data frame to include the new projects and demonstrate the final output.

b) Write a short note on variations of NoSQL architectural patterns. [10]

O.P. Code:- 87070

Program Code:- IT00737

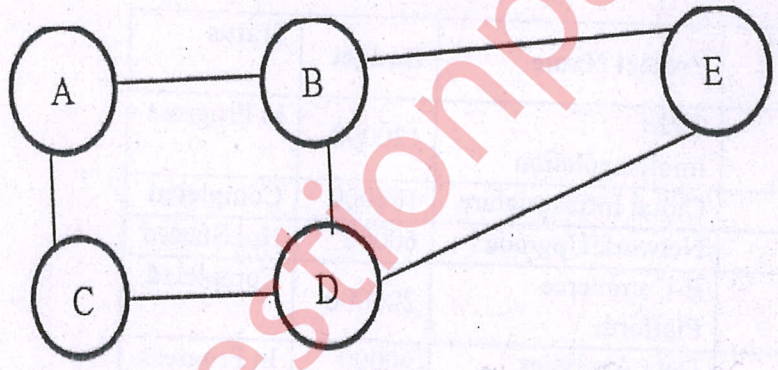
Q3 a) Suppose the stream is S = {10, 12, 8, 15, 6, 9, 14, 7}. Let hash functions $h(x) = 5x + 11 \bmod 32$ for some a and b, treat result as a 5-bit binary integer. Show how the Flajolet- Martin algorithm will estimate the number of distinct elements in this stream. [10]

b) Explain natural join and grouping and aggregation relational algebraic operation using MapReduce. [10]

Q4 a) Write a map reduce pseudo code to solve the word count problem. Apply map reduce working on the following document:
"Big data is powerful. Big data drives decisions." [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) List and discuss various types of data structures in R. [10]

Q6 a) Describe the components of Hadoop ecosystem with the help of a diagram. [10]

b) What is recommendation system? How is classification algorithm used in recommendation system? [10]

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