Time:3hrs   Max. Marks:80

N.B.: 1. Question no. 1 is compulsory.

2. Attempt **any Three** from out of remaining **Five** questions.

3. Assume suitable data wherever necessary.

4. Figures at right indicates full marks.

Q 1	a	Discuss Query Optimization in brief.	5
	b	Explain CAP Theorem in NoSQL.	5
	c	Differentiate between Data mart and Data Ware house.	5
	d	Discuss various characteristics of Big Data	5
Q 2	a	Explain Discretionary Access Control (DAC) and the Grant Option in DAC. Illustrate with a suitable example how the grant option works.	10
	b	What is a Federated Data Warehouse? Discuss its architecture.	10
Q 3	a	Differentiate between Star Schema and Snowflake Schema in data warehousing. Also, design a Star Schema for an E-commerce System and briefly explain its components.	10
	b	Explain in detail the Key-Value Store and Document Store data architectural patterns in NoSQL databases. Discuss their characteristics and provide suitable real-world use cases for each.	10
Q 4	a	Explain the ETL (Extract, Transform, Load) process in detail. Describe each phase with its purpose, tools commonly used, and its importance in data warehousing and business intelligence.	10
	b	What are Business Intelligence (BI) tools? Explain the commonly used BI tools and their key features.	10
Q5	a	Explain MOLAP, ROLAP, and HOLAP in detail. Discuss their differences, advantages, and typical use cases.	10
	b	Explain the External Merge Sort algorithm with a suitable example. Also, calculate the required number of block transfers and seek costs involved in the process.	10
Q6	a	Write a short note on OLTP (Online Transaction Processing).	5
	b	Write a short note on Distributed Database and its usefulness.	5
	c	Write a short note on Spatial Databases, highlighting their key features and uses.	5
	d	Write a short note on Mobile Databases, highlighting their key features and uses.	5

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