

TE Sem V R-19 C-Scheme INF T Winter 2025

Time: 3hrs

Max. Marks: 80

21/11/25

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

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

3. Assume suitable data wherever necessary.

4. Figures at right indicates full marks.

- Q 1 a Discuss Data Transformation with example. 5  
b Differentiate between Data Warehouse and Data Mart. 5  
c Describe Volume, Velocity with examples in Big Data. 5  
d Compare and contrast ACID and BASE. 5
- Q 2 a Discuss the various access control mechanisms used in database systems. 10  
Also, explain the GRANT and REVOKE operations with suitable examples.  
b List out the major ETL challenges and advantages. Also, mention various 10  
ETL tools used in data integration.
- Q 3 a Explain the External Merge Sort algorithm with a suitable example. Further, 10  
analyse and discuss the required number of block transfers and seek  
operations involved during the sorting process.  
b List and explain four commonly used NoSQL architectural patterns. Describe 10  
any two of these patterns in detail with suitable examples.
- Q 4 a Consider a retail company that wants to analyze its sales data. 10  
Explain how the company can design its data warehouse using Star Schema  
and Snowflake Schema explain.  
b Discuss the CAP Theorem and the key principles of BASE properties. 10
- Q 5 a. Explain various OLAP operations — Slice, Dice, Roll-up, Drill-down, and 10  
Pivot — using suitable real-world scenarios  
b. Explain Primary Horizontal, Derived Horizontal and Vertical Fragmentation 10  
with example. Comment on. Completeness, Reconstruction and Disjointness  
Properties.
- Q 6 a Describe data loading techniques in detail. 5  
b Discuss Spatial Database. 5  
c Explain Query processing in detail. 5  
d Define Factless fact table with example 5

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