

DISTRIBUTED DATABASES

Paper Code: ETIT-409

Paper: Distributed Databases

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INSTRUCTIONS TO PAPER SETTERS:

MAXIMUM MARKS: 75

1. Question No. 1 should be compulsory and cover the entire syllabus. This question should have objective or short answer type questions. It should be of 25 marks.
2. Apart from Question No. 1, rest of the paper shall consist of four units as per the syllabus. Every unit should have two questions. However, student may be asked to attempt only 1 question from each unit. Each question should be of 12.5 marks.

Objective: The objective of this paper is to facilitate the student with principles and foundations of Distributed databases.

UNIT I

Architecture of distributed systems: network operating system, distributed operating systems, Distributed database systems. (a) Federated database systems, (b) multi database systems, and (c) Client/Server systems, Distributed DBMS architecture.

Distributed database design: Top down design- Designing issues, Fragmentation, Allocation, Data dictionary, Bottom up design- Schema Matching, Schema Integration, Schema Mapping, Data Cleaning

Data and Access Control: views in centralised and distributed DBMS, Data security, Semantic Integrity Control.

[T1, R1][No. of Hours: 10]

UNIT II

Query Processing: Characterization of query processors, Layers of query processing, Query Decomposition: Normalization, Analysis, Elimination of redundancy,

Data Localization: Reduction of primary horizontal fragmentation, Reduction of vertical fragmentation, reduction of derived fragmentation, hybrid fragmentation.

Optimization of Distributed Query: Join ordering, Semi join based algorithms, optimization

[T1, T2][No. of Hours: 11]

UNIT III

Transaction Management: Properties of transactions, Types of transactions- flat transactions, nested transactions, workflow.

Distributed Concurrency Control: Serializability theory, Locking based concurrency control Algorithm, Tim-stamp based algorithms,

Deadlock Management: Prevention, Avoidance, Detection and Resolution

[T1, T2][No. of Hours: 10]

UNIT IV

Distributed DBMS Reliability: Local Reliability protocol, Distributed Reliability protocol- two phase commit protocol, three phase commit protocol.

Parallel Database System: System architecture, Parallel query processing, Load Balancing, Database Clusters. Web Data Management: Web Search-crawling, indexing ranking, Web Querying, Distributed XML Processing.

[T1, R2][No. of Hours: 11]

Text Books:

[T1] Principles of Distributed Database Systems. Ozsu and Valduriez. Prentice Hall.

[T2] Distributed Database Principles and Systems. Ceri and Pelagatti. McGraw Hill.

Reference Books:

[R1] Distributed Systems: Concept and Design. Coulouris, Dollimore, and Kindberg. AW.

[R2] Recovery Mechanisms in Database Systems. Kumar and Hsu, Prentice Hall.

[R3] Concurrency Control and Recovery in Database Systems. Bernstein, Hadzilacos and Goodman, AW