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Paper Code : PEC-IT601B Distributed Systems

UPID : 006590

Time Allotted : 3 Hours   *Full Marks :70*

The Figures in the margin indicate full marks.

Candidate are required to give their answers in their own words as far as practicable

Group-A (Very Short Answer Type Question)

1. Answer any ten of the following :   [1 x 10 = 10]
    - (I)   What is data replication?
    - (II)   What is minterm predicate?
    - (III) Define homogeneous distributed database.
    - (IV) What is the maximum no of functional dependencies (trivial and non-trivial) of a relation R of degree n?
    - (V)   Write the full form of OLAP.
    - (VI) What is data dictionary?
    - (VII) Provide a technique for recovery management.
    - (VIII) Edit of a data item in a transaction is done in which mode?
    - (IX) What are the attribute usage values?
    - (X)   What do you mean by granularity?
    - (XI) What is the disadvantage of replication?
    - (XII) Who is responsible for ensuring correct execution of a transaction in the presence of failures?

Group-B (Short Answer Type Question)

Answer any three of the following :   [5 x 3 = 15]

2. What are the advantages and disadvantages of replication? What is auxiliary program?   [5]
3. Write down the Dynamic query optimization methods with example.   [5]
4. Which components are necessary for building a distributed database?   [5]
5. Explain distributed cost model with example.   [5]
6. What is DDBMS ? What are the features of DDBMS ?   [5]

Group-C (Long Answer Type Question)

Answer any three of the following :   [15 x 3 = 45]

7. Explain the following in detail: [8+4+3]
    i. Query optimization issues in DDBs.
    ii. World Wide Web Architecture and Protocols.
    iii. Data warehousing architectures.

8. What is flat transaction and nested transaction?   [4+6+5]
    Discuss about dirty-read, fuzzy read and phantom.
    What is ACID in DDBMS?

9. Briefly describe the various implementations of the process pairs concept. Comment on how process pairs   [15]
    may be useful in implementing a fault tolerant distributed DBMS.

10. Write down "Basic Timestamp Ordering Scheduler (BTO-SC) Algorithm".   [8+7]
    Write down "Data Processor (DP) Algorithm" .

11. Discuss different types of search strategies.   [6+4+5]
    What is search space in distributed query optimization?
    Simplify the following query, expressed in SQL, using idempotency rules:
    SELECT ENO
    FROM ASG
    WHERE RESP = "Analyst"
    AND NOT(PNO="P2" OR DUR=12)
    AND PNO != "P2"
    AND DUR=12