BRAINWARE UNIVERSITY

Term End Examination 2018 - 19

Programme – Master of Technology in Computer Science & Engineering

Course Name – Advanced DBMS

Course Code – MCSE010402

(Semester – 1)

Time allotted: 3 Hours   **Full Marks: 70**

[The figure in the margin indicates full marks. Candidates are required to give their answers in their own words as far as practicable.]

Group –A

(Multiple Choice Type Question)   10 x 1 = 10

1.   *Choose the correct alternative from the following*

(i)   Data Dictionary stores

    a.   Meta-data about the structure of the database
    b.   All possible SQL queries

    c.   Raw data of tables value
    d.   None of these

(ii) Preservation of functional dependency is ensured by which of the correctness rule of the fragmentation?

    a.   Disjointness
    b.   Completeness

    c.   Reconstruction
    d.   All of these

(iii) The type of mapping defined in the allocation schema (whether the distributed DBMS is redundant or non-redundant) is

    a.   One-to-Many
    b.   One-to-One

    c.   Many-to-Many
    d.   Many-to-One

(iv) Two-phase commitment protocol is used for

    a.   Concurrency control
    b.   Integrity control

    c.   Recovery
    d.   Redundancy

(v)   Changes made in a database are called

    a.   Transaction
    b.   Replication

    c.   Commit
    d.   Fragmentation

(vi) Shared memory is

    a. Loosely coupled architecture   b. Tightly coupled architecture

    c. Both (a) and (b)   d. None of these

(vii) Vertical Fragmentation is a set of sub-relations each of which have a subset of

    a. Attributes   b. Tuples

    c. Both (a) and (b)   d. None of these

(viii) Which of the following is increased with redundant data in distributed database system?

    a. Reliability   b. Availability

    c. Inconsistency   d. All of these

(ix) Data about data is called

    a. Data catalog   b. Metadata

    c. Information   d. All of these

(x) Which of the following operations is used to reconstruct the global relation from its horizontal fragments?

    a. Join   b. Cartesian product

    c. Union   d. Intersection

Group – B

(Short Answer Type Questions)   3 x 5 = 15

Answer any *three* from the following

2. (a) What do you mean by distributed database?   2

   (b) Compare the features of distributed database versus centralized database.   3

3. (a) What do you mean by join graph?   1

   (b) What are the different types of join graph?   2

   (c) Why join graph is used in distributed database systems?   2

4. (a) What is replication?   2

   (b) Describe quorum algorithm.   3

5. How atomicity property is maintained by the distributed database.   5

6. (a) What is false deadlock?   2

   (b) What are the different approaches to solve the problem of false deadlock?   3

Group – C

(Long Answer Type Questions)   3 x 15 = 45

Answer any *three* from the following

7. (a) Explain the various component of distributed database management system.   4

    (b) What is the difference between homogeneous and heterogeneous distributed DBMS?   3

    (c) What is distribution transparency? Explain with an example.   4

    (d) What is the difference between Semi Join and Natural Join?   2

    (e) What is physical image of a global relation? Explain with an example   2

8. (a) How distributed database is differ from the centralized database in respect to data independency and data redundancy?   5

    (b) Discuss the scope for developing a distributed database system for each of the following aspects:

       i) Interconnection of existing databases

       ii) Incremental growth of organization

       iii) Communication overhead

       iv) Reliability and availability   8

    (c) What is graceful degradation property?   2

9. (a) Write down the 2-phase commitment protocol with diagram.   8

    (b) Discuss the behavior of the 2-phase commitment protocol in presence of different kinds of failures.   7

10. (a) Briefly describe architectural models for distributed DBMSs with respect to

       i) the autonomy of local systems

       ii) their distribution

       iii) their heterogeneity   6

    (b) Define horizontal and vertical fragmentations with suitable examples.   4

    (c) What is derived horizontal fragmentation?   3

    (d) Why derived horizontal fragmentation is so significant in distributed database systems?   2

11. (a) Assume that strick two phase locking is in use, describe how the actions of the two phase commit protocol relate to the concurrency control action of each individual server.   6

    (b) How does distributed deadlock detection fit in?   4

    (c) How wait-for graph helps in deadlock detection?   5