



**BRAINWARE UNIVERSITY**

**Coursework Examination 2018 – 19 (June 2019)**

**Programme – Ph.D.(CS) / Ph.D.(CSE)**

**Course name - Advanced DBMS**

**Course Code - PHD-CS-03**

**Time allotted: 3 Hours**

**Full Marks : 100**

[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) Distributed database has which of the following advantages over a centralized database?
    - a. Software cost
    - b. Software complexity
    - c. Slow Response
    - d. Modular growth
  - (ii) Which of the following is not one of the stages in the evolution of distributed DBMS?
    - a. Unit of work
    - b. Remote unit of work
    - c. Distributed unit of Work
    - d. Distributed request
  - (iii) Location transparency allows for which of the following?
    - a. Users to treat the data as if it is at one location
    - b. Programmers to treat the data as if it is at one location
    - c. Managers to treat the data as if it is at one location
    - d. All of the above.
  - (iv) A heterogeneous distributed database is which of the following?
    - a. The same DBMS is used at each location and data are not distributed across all nodes.
    - b. The same DBMS is used at each location and data are distributed across all nodes.
    - c. A different DBMS is used at each location and data are not distributed across all nodes
    - d. A different DBMS is used at each location and data are distributed across all nodes.

- (v) A homogenous distributed database is which of the following?
- a. The same DBMS is used at each location and data are not distributed across all nodes.
  - b. The same DBMS is used at each location and data are distributed across all nodes.
  - c. A different DBMS is used at each location and data are not distributed across all nodes
  - d. A different DBMS is used at each location and data are distributed across all nodes.
- (vi) A semijoin is which of the following?
- a. Only the joining attributes are sent from one site to another and then all of the rows are returned.
  - b. All of the attributes are sent from one site to another and then only the required rows are returned.
  - c. Only the joining attributes are sent from one site to another and then only the required rows are returned.
  - d. All of the attributes are sent from one site to another and then only the required rows are returned.
- (vii) Which of the following is a disadvantage of replication?
- a. Reduced network traffic
  - b. If the database fails at one site, a copy can be located at another site
  - c. Each site must have the same storage capacity
  - d. Each transaction may proceed without coordination across the network
- (viii) Which transaction contains statements that access more than one node?
- a. A Remote Transaction
  - b. A Distributed transaction
  - c. Both A & B
  - d. None of the above.
- (ix) A distributed transaction can be ..... if queries are issued at one or more nodes.
- a. fully read-only
  - b. partially read-only
  - c. fully read-write
  - d. partially read-write
- (x) Stored procedures have which of the following advantages?
- a. It takes a longer time to write them as compared to writing Visual Basic.
  - b. Network traffic increases
  - c. Data integrity improves as multiple applications access the same stored procedure.
  - d. Result in thicker client and thinner database server.

**Group – B**

(Short Answer Type Questions)

6 x 5 = 30

Answer any Six from the following

- |    |  |   |
|----|--|---|
| 2. | Describe the evolution of distributed DBMS from the centralized DBMS               | 5 |
| 3. | Discuss catalog management in DDBMS.   | 5 |
| 4. | What are advantages and disadvantages of Distributed DBMS                          | 5 |
| 5. | Why is the replication useful in DDBMS? What typical units of data are replicated? | 5 |
| 6. | Explain the basic Timestamp Ordering Algorithm.                                    | 5 |
| 7. | What are the objectives of Distributed Query Processing?                           | 5 |
| 8. | Show horizontal fragmentation rule with example in DDB.                            | 5 |
| 9. | Describe serializability in a distributed database.                                | 5 |

**Group – C**

(Long Answer Type Questions)

6 x 10 = 60

Answer any six from the following

- |     |   |     |
|-----|---|-----|
| 10. | What is a fragment of a relation? Explain different types of fragmentation.   | 10  |
| 11. | What are the various kinds of transparencies in distributed database design? Explain each with the help of example.   | 10  |
| 12. | What are the various concurrency control techniques? Compare Lock based Concurrency Control strategies in detail.   | 10  |
| 13. | a) Consider the following transactions<br>T1 : { R(X), W(X), Commit }<br>T2 : { W(X), W(Y), R(Z), Commit }<br>T3 : { R(X), R(Y), R(Z), Commit }<br>Write a serial schedule involving T1,T2,T3 | 5   |
|     | b) Determine whether the following schedules are serializable or not<br>S1 : Ri(X), Wi(X), Rj(X), Wj(X)<br>S2 : Rj(X), Wj(X), Ri(X), Wi(X)  | 5   |
| 14. | Explain the phases of query processing in distributed database.   | 10  |
| 15. | What do you mean by distributed commit and distributed deadlock?  | 10  |
| 16. | Draw and explain the Transaction management model for distributed System.   | 5+5 |
| 17. | Explain conflict serializability and view serializability in RDBMS with a suitable example.   | 5+5 |