(3 Hours)

N.B. :   (1) Question **No. 1** is **compulsory**.

[Total Marks: 80]

(2) Answer any **three** out of the **remaining** questions.

Q 1.

    a) Define Client Server and Peer to Peer distributed system architecture.   [05]

    b) Give two applications of XML   [05]

    c) What do you mean by serializabilty in a distributed database?   [05]

    d) Explain the concept of a "semi-join" using an example.   [05]

Q.2. Using a snapshot of the following centralized schema of a database:

- Departments*(DN, DName, Budget, Location)*
- Employees*(EN, EName, Title, DNo)*
- Salary*(Title, Salary)*

    a) Show 2 examples of horizontal fragmentation with fragmentation rules   [05]

    b) Show 2 examples of vertical fragmentation with fragmentation rules   [05]

    c) Show 2 examples of derived fragmentation with fragmentation rules   [05]

    d) Demonstrate the correctness of your fragmentation rules.   [05]

Q 3.

(a) Consider a employee management database which maintains entries for employees in a company. Employees may be programmers, managers, designers and testers. Appropriate information is to be maintained for each employee along with their address, salary, etc. (You can make any other reasonable assumptions)

    I.   Give the DTD for the XML schema for the described system.   [05]

    II.   Write the following query in XQuery   [05]

    "Find programmers who have worked in projects coding at least two different languages in one year."

(b) Describe query processing in a distributed database.   [10]

Q 4.

    (a) Explain the different types of transparencies in a Distributed Database System   [10]

    (b) Describe clearly the Three Phase Commit (3PC) algorithm?   [10]

Q 5.

    a) Explain two concurrency control algorithms for a distributed database system   [10]

    b) What are the issues for query processing in a heterogeneous database?   [10]

Q 6. Write Short notes on:

    a) Heterogeneous Database Architecture.   [10]

    b) Distributed Deadlock Management.   [10]