

(3 Hours)

[Total Marks: 80]

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

(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]