

1. (a) Explain the following concept :— 5
- (i) Data
  - (ii) Database
  - (iii) Database Management System
  - (iv) SQL
  - (v) OQL
- (b) Consider a banking system where each bank has multiple branches and each branch can have multiple accounts and loan. 15
- (i) Draw an EER Diagram.
  - (ii) Design object oriented Database Schema for the same.
  - (iii) Using OQL retrieve the name of all customers having a loan amount more than 2 lakh.
2. (a) What is the difference between structured semistructured and unstructured data ? 10  
What do you understand by the term self-describing data ?
- (b) Differentiate between XML, DTD, and XML Schema with an example. 10
3. (a) What do you mean by data fragmentation, why is fragmentation useful in distributed database ? Explain in brief different types of fragmentation. 10
- (b) Explain various types of transparencies in distributed databases and also explain concurrency control and recovery in distributed databases. 10
4. (a) Explain design and implementation issues in mobile databases. Comment on limitations. 10
- (b) Explain the need of temporal databases with a clear design example. 10
5. (a) Compare and contrast the object and the relational data models. 10
- (b) Explain ORDBMS with reference to 10
- (i) Representing multivalued attributes using VARRAY
  - (ii) Nested Tables.
6. (a) Explain deductive database with respect to need, storage, optimization and querying. 10
- (b) University of Mumbai wants to put up its database of central admissions result of engineering for the past 5 years on to the web. Describe the XML Schema design for the database. 10
7. Write short notes on any **four** :— 20
- (a) Object Identity
  - (b) Persistent datatype
  - (c) Subclass / Superclass
  - (d) Complex Objects
  - (e) Spatial Databases
  - (f) GIS (Geographical Information System)