



- Notes :
1. All questions are compulsory.
  2. All questions carry equal marks.
  3. Due credit will be given to neatness and adequate dimensions.
  4. Assume suitable data wherever necessary.

1. a) Define Data Model. Explain Network Data Model & Hierarchical Data Model with example. 8

b) Write a note on E – R diagram. Draw and explain ER diagram for Banking. 8

**OR**

2. a) Discuss components of DBMS and draw diagram. 8

b) Explain Disadvantages of file processing system. 8

3. a) Write a note on following with example. 8

- |                       |                        |
|-----------------------|------------------------|
| i) Primary key        | ii) Foreign key        |
| iii) Check constraint | iv) Data Independence. |

b) Given the schema for Employee – Department database. 8

Employee (Emp\_id, Name, Address, Designation, Salary)

Department (Dept\_id, Name, Head\_id)

Write SQL queries for following.

- i) Write create table and insert command for above schema.
- ii) Give the details of employee who get the maximum salary.
- iii) List names of all employees who earn more than Rs. 1,00,000 in a year.
- iv) Give the name of employee who is head of department.

**OR**

4. a) Explain the following operations with relational algebra expressions. 8

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|--------------------------|----------------------|
| i) Select                | ii) Project          |
| iii) Cartesian – product | iv) Set – difference |

b) Explain following constraints with its types & example. 8

- i) Domain Integrity Constraint
- ii) Entity Integrity Constraints
- iii) Referential Integrity Constraints.

5. a) Write a note on functional dependency. Also explain? 8

- i) Transitive Functional Dependency.
- ii) Multivalued Functional Dependency

b) Explain 2NF and 3NF with example. 8

**OR**

6. a) Explain Codd's rule any eight. 8
- b) Write a note on following with example. 8
- i) Lossless Decomposition.
  - ii) Update Anamoli
  - iii) Delete Anamoli
  - iv) Insertion Anamoli
7. a) Write a short note on. 8
- i) Lock Based Protocol.
  - ii) Time stamp Based protocol.
- b) What is mean by Transaction? Draw and explain state of transaction. 8

**OR**

8. a) Write a short note on. 8
- i) Shadow paging
  - ii) Log – Based Recovery
- b) Describe following with reference to transaction management. 8
- i) Checkpoint
  - ii) Validation Techniques.
9. a) Describe following systems. 8
- i) Client – server system.
  - ii) Parallel system.
- b) Explain online analytical processing (OLAP) in detail. 8

**OR**

10. a) Write a short note on. 8
- i) Data Warehousing.
  - ii) Data Mining
- b) Explain following. 8
- i) Spatial & Geographical databases
  - ii) Multimedia Databases.

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