

Database Management System

Time: 3 hrs.

Max. Marks: 80

*Note: Answer any FIVE full questions, choosing ONE full question from each module.***Module-1**

- 1 a. Discuss the advantages of using the DBMS approach. (06 Marks)
- b. Explain three-schema architecture with a neat diagram. Why do we need mapping between schema levels? (06 Marks)
- c. What is Data Independent? Explain different types of Data Independence. (04 Marks)

OR

- 2 a. Explain the component modules of DBMS and their interaction with a neat diagram. (06 Marks)
- b. Explain different types of attributes that occur in ER model with an example. (06 Marks)
- c. Design a ER diagram for keeping track of information about Bank database taking into an account atleast four entities. (04 Marks)

Module-2

- 3 a. Discuss the characteristics of relations that make them different from ordinary tables and files. (08 Marks)
- b. Explain the steps to convert the basic ER model to relational database schema. (08 Marks)

OR

- 4 a. What are the basic data types available for attributes in SQL? Explain with example. (06 Marks)
- b. Define foreign key. Explain all possible options that can be specified when a referential integrity constraint is violated. (04 Marks)
- c. Write the SQL syntax with example for the following : (06 Marks)
 - (i) ALTER
 - (ii) INSERT
 - (iii) UPDATE

Module-3

- 5 a. Explain the following with an example. (06 Marks)
 - (i) Correlated nested queries
 - (ii) Assertions.
- b. Explain aggregate functions in SQL with example. (04 Marks)
- c. Consider the following tables:
 - WORKS(Pname, Cname, Salary)
 - LIVES(Pname, Street, City)
 - LOCATED_IN(Cname, City)
 - MANAGER(Pname, Mgrname)
 Write the SQL Query for the following :
 - (i) Retrieve the names of the people who work for Wipro along with the address they live in.
 - (ii) Retrieve the name of the person who gets second highest salary.
 - (iii) Find the number of employee and average salary of each company. (06 Marks)

OR

- 6 a. Explain the following with an example:
(i) Cursor
(ii) Database Stored Procedure. (08 Marks)
b. Explain the Standard Three-Tier Architecture and list the advantages. (08 Marks)

Module-4

- 7 a. What is Functional Dependency? Explain the inference rules for functional dependency with proof. (08 Marks)
b. Define 1NF, 2NF and 3NF by taking an example. (08 Marks)

OR

- 8 a. Write an algorithm to find a minimal cover for a set of functional dependencies. (04 Marks)
b. Find the closure sets with respect to F.
 $F = \{ssn \rightarrow \{Ename, Bdate, Address, Dnumber\}, Dnumber \rightarrow \{Dname, Dmgr_ssn\}\}$ (04 Marks)
c. Which normal form is based on the concept of multivalued functional dependency? Explain the same with example. (08 Marks)

Module-5

- 9 a. What are the problems faced when concurrent transactions are executed in an uncontrolled manner? Give an example and explain. (06 Marks)
b. With a neat diagram explain the states for transaction execution. (06 Marks)
c. Briefly explain the desirable properties of transactions. (04 Marks)

OR

- 10 Write a note on :
a. Timesamp ordering (08 Marks)
b. NO-UNDO/REDO recovery algorithm. (08 Marks)