April 2025
B.A./B.Sc.
Fourth Semester
CORE – 10
COMPUTER SCIENCE
Course Code: CSC 4.31
(Database Management Systems)

Total Mark: 70 *Pass Mark: 28*
Time: 3 hours

Answer five *questions, taking* one *from each unit.*

UNIT–I

1. (a) What is data and database? Give an example of a database. 2+1=3
   (b) What is DBMS? List and explain any four characteristics of DBMS. 1+4=5
   (c) Discuss the different types of DBMS architectures with diagrams. 6

2. (a) Explain in detail with illustrations, the three-schema architecture of DBMS. 10
   (b) Write a note on any one type of data model in DBMS. 4

UNIT–II

3. (a) Define entity and weak entity. Give examples for both. 2+2=4
   (b) What is a relationship in DBMS? What are the different types of relationships? 1+4=5
   (c) What is a key? Explain primary key and foreign key with examples for each. 1+4=5

4. (a) Explain the different types of attributes with illustrations for each. 4
   (b) What is DBMS generalization? 2
   (c) Write and explain the rules to convert ER diagram to tables with illustrations. 8

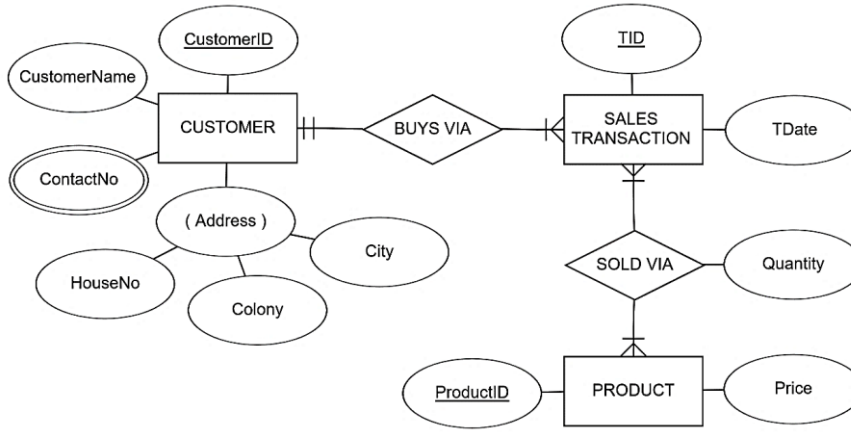
UNIT–III

5. (a) Briefly explain the following terms: 1×6=6
   (i) Relation
   (ii) Tuple
   (iii) Attribute
   (iv) Degree
   (v) Cardinality
   (vi) Domain
   (b) What is a relational model? How does it work? 1+2=3
   (c) Write any five Codd's 12 rules for relational model. 5

6. (a) Explain the following relational algebra operations with examples. 3×3=9
   (i) Union
   (ii) Set difference
   (iii) Cartesian product
   (b) Explain the query process in SQL with a help of a diagram. 5

UNIT–IV

7. (a) Map the following ER model to relational model: 10



   (b) Explain multi-valued and transitive functional dependencies with examples. 4

8. (a) What is normalization? Why do we need normalization? 1+2=3
   (b) Explain the 1NF, 2NF and 3NF. 3+4+4=11

UNIT–V

9. (a) Explain the two types of sequential file organization. 6
   (b) Write two pros and two cons of using sequential file organization. 4
   (c) Write a note on heap file organization. 4

10. (a) What is hash file organization? Explain how a new record is inserted in hash file organization. 3+3=6
    (b) Explain the structure of B+ file organization with an example. 8
