2023
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 <u>five</u> *questions, taking* <u>one</u> *from each unit.*

UNIT–I

1. (a) What is DBMS? List and explain any seven characteristics of DBMS.   1+7=8
   (b) Explain the 1-tier, 2-tier, and 3-tier architecture in DBMS.   6

2. (a) Write a note on the three-schema architecture.   6
   (b) Explain the four types of data models.   8

UNIT–II

3. (a) What do you mean by entity and weak entity?   2
   (b) What is an attribute? Explain the types of attribute.   1+4=5
   (c) Define a key. What are the different types of keys?   1+6=7

4. (a) What are one-one, one-to-many, and many-to-many relationships?   6
   (b) Explain the rules used in reduction of ER diagram to a relational table.   8
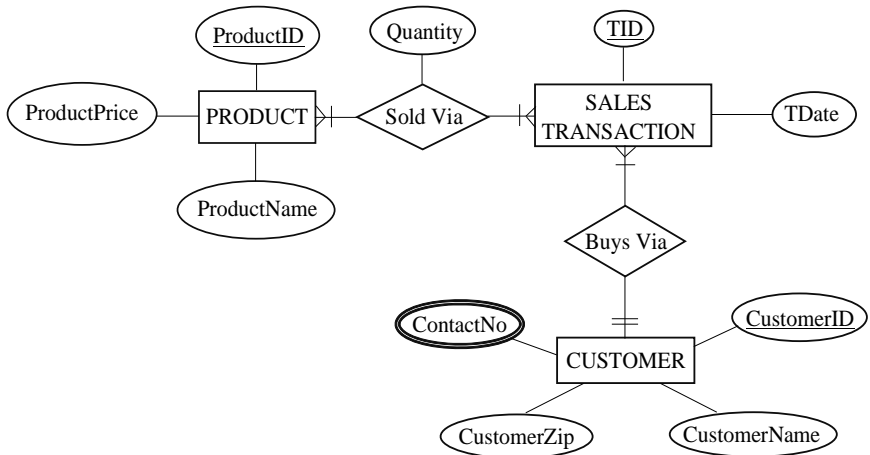
UNIT–III

5. (a) What is a relational model? How does it work?   2+2=4
   (b) What is RDBMS? Draw an illustration showing the various terminologies of RDBMS.   1+9=10

6. (a) Explain the following relational algebra operations- select, project, union and set difference. 8

(b) What is SQL? Explain the process of SQL. 1+5=6

UNIT–IV

7. (a) Map the following ER model to relational model: 9

(b) Explain functional dependency with examples. What are trivial and non-trivial functional dependencies? 3+2=5

8. (a) What is normalization? Explain the 1NF, 2NF, and 3NF. 1+9=10

(b) What do you mean by lossless and lossy decomposition? 4

UNIT–V

9. (a) Explain the two methods to implement sequential file organization. 8

(b) What is a B$^+$ file organization? Explain the structure of a B$^+$ tree.

2+4=6

10. (a) What are heap file organizations? Write its pros and cons. 4+4=8

(b) Explain how indexing works in DBMS. What are the types of indexing? 3+3=6

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