Reg. No. :

Question Paper Code : 90256

M.C.A. DEGREE EXAMINATIONS, APRIL/MAY 2022.

Second Semester

(Bridge Course)

BX 4004 – DATABASE MANAGEMENT SYSTEMS

(Regulations 2021)

Time : Three hours Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Define a data model.
2. State the types of Attributes in ER Model.
3. Give the syntax for creating a table in SQL.
4. What are the disadvantages of relational model?
5. Define Boyce codd normal form. Why BCNF Stricter then 3NF?
6. Define functional Dependency.
7. What are ACID Properties?
8. What is a shadow copy scheme?
9. Define Hashing.
10. State the disadvantages of B Tree over B+ Tree.

PART B — (5 × 13 = 65 marks)

11. (a) With a neat diagram, explain the components of DBMS Architecture.

Or

(b) (i) Bring out the building blocks of ER Diagram. (5)

(ii) Explain the concept of ER model. (8)

12. (a) Define relational algebra. Explain various relational algebraic operations with example.

Or

(b) Consider the given relation schema.

Employee (empno, name, office, age)

Books(isbn, title,authors, publisher)

Loan(empno,isbn,date)

Write the following queries in SQL

(i) Find the name of all employees who have borrowed a book published by McGraw-Hill.

(ii) Find the name of all employees who have borrowed all book published by McGraw-Hill.

(iii) Find the names of employees who have borrowed more than five different books published by McGraw-Hill.

(iv) For each publisher, find the name of employees who have borrowed more than five books of that publisher.

13. (a) What is Normalization? Explain First Normal Form with a neat example.

Or

(b) Explain join dependency and fifth normal form(5NF).

14. (a) With a neat diagram explain shadow paging concept. (13)

Or

(b) What is serializability? Explain its types.

15. (a) How the records are represented and organized in files? Explain with suitable example.

Or

(b) Illustrate indexing and hashing techniques with suitable examples.

PART C — (1 × 15 = 15 marks)

16. (a) A car rental company maintains a database for all vehicles in its current fleet. For all vehicles, it includes the vehicle identification number, license number, manufacturer, model, date of purchase and colour. Special data are included for certain types of vehicles.

Trucks: cargo capacity.

Sports car: horsepower, renter age requirement

Vans:number of passengers

Off-road vehicle: ground clearance, drivetrain (four or two-wheeler drive)

Construct an ER model for the car rental company database.

Or

(b) Consider the following schedules. The actions are listed in the order they are schedule, and prefixed with transaction name.

S1:T1:R(X), T2:(Rx), T1:W(Y),T2:W(Y),T1:R(Y), T2:R(Y)

S2:T3:R(X),T1:R(X),T1:W(Y),T2:R(Z),T2:W(Z),T3:R(Z)

For each of the schedules, answer the following questions:

(i) What is the precedence graph for the schedule?

(ii) Is the schedule conflict-serializable? If so, What are all the conflict equivalent serial schedules?

(iii) Is the schedule view-serializable? If so, What are all the view equivalent serial schedules?
