Reg. No. : ☐☐☐☐☐☐☐☐☐☐☐☐☐

Question Paper Code : 90414

B.E./B.Tech. DEGREE EXAMINATIONS, NOVEMBER/DECEMBER 2022.

Third/Fourth/Fifth/Eighth Semester

Computer Science and Engineering

CS 8492 — DATABASE MANAGEMENT SYSTEMS

(Common to: Computer and Communication Engineering/Mechanical and Automation Engineering/Mechatronics Engineering/Computer Science and Business Systems/Information Technology)

(Regulations 2017)

Time : Three hours   Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. What are the three levels of data abstraction?

2. Differentiate primary key and foreign key.

3. What are the various types of attributes in ER model?

4. Differentiate Generalization and Specialization.

5. Name the types of locks.

6. Draw the diagram that represents transaction states.

7. Define index.

8. State the main difference between B tree and B+ tree.

9. Differentiate fragmentation and replication.

10. Define page ranking.

PART B — (5 × 13 = 65 marks)

11. (a) (i) Define relational algebra. Explain the basic operations in relational algebra. (6)

    (ii) Explain the structure and features of a relational databases. (7)

Or

    (b) With a neat diagram, explain the components of database system architecture. (13)

12. (a) (i) Explain the concept of Functional Dependency with suitable example. (6)

    (ii) Write a brief note on extended ER features. (7)

Or

    (b) (i) Give suitable example for Multivalued dependencies and Join dependencies. (6)

    (ii) Compare and contrast 1NF, 2NF and 3NF with suitable example. (7)

13. (a) (i) Define Transaction. Explain the desirable properties of a transaction. (6)

    (ii) Briefly discuss about the different deadlock prevention schemes. (7)

Or

    (b) (i) Discuss the role of two-phase locking protocol for concurrency control. (6)

    (ii) With suitable example, explain the concept of conflict serializability. (7)

14. (a) (i) With a neat diagram, discuss about the various RAID levels. (6)

    (ii) Explain the various types of indices with relevant example. (7)

Or

    (b) (i) With a neat diagram, explain the steps involved in query processing. (6)

    (ii) Compare and contrast the features of static and dynamic hashing. (7)

15. (a) (i) With a neat diagram, explain the system structure of a distributed database. (6)

(ii) Describe how table inheritance and type inheritance is achieved in SQL. (7)

Or

(b) (i) Discuss how you extract XML documents from relational databases. (6)

(ii) Give some metrics to measure the information retrieval effectiveness. (7)

PART C — (1 × 15 = 15 marks)

16. (a) (i) Consider a XML schema Book with the following structure.

Book (id, name, author, price, publisher)

Write the DTD for the above schema. (8)

(ii) What are the building blocks of an ER diagram? Draw the ER diagram for Railway Reservation System. (7)

Or

(b) Consider the following data base schema.

Book (B_id, B_name, B_author, B_publisher).

Student (S_id, S_name, S_dept, S_gender).

Borrow (B_id, S_id, date).

(i) Justify whether the given database schema is in normalized structure. (5)

(ii) Solve the following using both Relational Algebra and SQL. (10)

1. Print the name of the 'female' student who borrowed DBMS book.

2. Print the name of the student who got books on 04.03.2022.

3. Print the name of the book which was borrowed by both male and female student.

4. How many students have taken books on 12.03.2022.

5. Print the name of the authors and no. of books they have written.