Fifth Semester B.E. Degree Examination, Dec.2024/Jan.2025
Database Management Systems

Time: 3 hrs.   Max. Marks: 100

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

Module-1

1 a. Discuss the main characteristics of the database approach. How does it differ from traditional file systems? **(08 Marks)**
   b. With neat diagram, explain three schema architecture. **(06 Marks)**
   c. What are the different types of database end users? Discuss the main activities of each. **(06 Marks)**

OR

2 a. Design an ER diagram for company database with atleast four entities. **(08 Marks)**
   b. Define the following with an example :
      i) Weak entity type   ii) Participation constraints   iii) Cardinality ratio
      iv) Recursive relationship. **(08 Marks)**
   c. What is Generalization? Illustrate how it is helpful with an example. **(04 Marks)**

Module-2

3 a. What is meant by integrity constraint? Explain the importance of referential integrity constraint. How referential integrity constraint is implemented in SQL? **(08 Marks)**
   b. Explain with examples in SQL :
      i) Drop command   ii) Delete command   iii) Update command. **(06 Marks)**
   c. Discuss various types of inner join operations. **(06 Marks)**

OR

4 a. Write the relational algebra operations to perform the following queries :
      i) Retrieve the name and address of all employees who work for the "Accounts" department.
      ii) Retrieve the names of employees who have no dependents.
      iii) Find the names of employees who work on all the projects controlled by department number 2. **(12 Marks)**
   b. Describe the steps of an algorithm for ER – to – Relational mapping. **(08 Marks)**

Module-3

5 a. How are triggers and assertions defined in SQL? Explain. **(08 Marks)**
   b. How are views created and dropped? Explain how the views are implemented and updated. **(08 Marks)**
   c. What is SQLJ? How it is different from JDBC? **(04 Marks)**

OR

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6 a. With an example, explain stored procedures in SQL. **(06 Marks)**
   b. Draw and explain three – tier architecture and technology relevant to each tier. Write the advantages of three – tier architecture. **(06 Marks)**
   c. What are the components of the JDBC architecture? Describe four different architecture alternations for JDBC drivers. **(08 Marks)**

Module-4

7 a. Define Normal form. Explain 1NF , 2NF and 3NF with suitable example. **(08 Marks)**
   b. Write an algorithm to find the closure of 'X' and 'F'. **(06 Marks)**
   c. Explain any two informal quality measures employed for a relational schema design. **(06 Marks)**

OR

8 a. Explain the 4NF with a suitable example. **(08 Marks)**
   b. Write an algorithm for testing non additive join property. **(08 Marks)**
   c. Explain Armstrong inference rules. **(04 Marks)**

Module-5

9 a. Why concurrency control is needed? Demonstrate with an example. **(10 Marks)**
   b. Discus the ACID properties of a database transaction. **(04 Marks)**
   c. Discuss the UNDO and REDO operations and the recovery techniques that use each. **(06 Marks)**

OR

10 a. Discuss Two – Phase locking technique for concurrency control. **(10 Marks)**
    b. Explain transaction supports in SQL. **(06 Marks)**
    c. Explain how shadow paging helps to recover from transaction failure. **(04 Marks)**

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