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Fifth Semester B.E. Degree Examination, June/July 2019
Database Management Systems

Time: 3 hrs.

Max. Marks:100

*Note: Answer any FIVE full questions, selecting
at least TWO full questions from each part.*

PART – A

- 1 a. Discuss the main characteristics of the database approach and how differs from traditional file systems. (12 Marks)
- b. Discuss the different types of user-friendly interfaces and the types of users who typically use each. (08 Marks)
- 2 a. With an aid of a neat diagram, describe a simplified database design process. (08 Marks)
- b. What is an entity type? What is an entity set? Explain the differences among an entity, an entity type, and an entity set. (06 Marks)
- c. When is the concept of a weak entity used in data modeling? Define the terms owner entity type, weak entity type, identifying relationship type and partial key. (06 Marks)
- 3 a. Briefly discuss the different types of update operations on relation. (10 Marks)
- b. With an example for each, explain the purpose and notation for the following operations of relational algebra:
 - i) SELECT
 - ii) THETA JOIN
 - iii) UNION
 - iv) CARTESIAN PRODUCT
 - v) DIVISION (10 Marks)
- 4 Consider the following schemes:
 Sailors (Sid : integer, sname : string, rating : integer, age : real)
 Boats (bid : integer, bname : string, color : string)
 Reserves (Sid : integer, bid : integer, day : date)
 Write the following queries in SQL. No duplicate should be printed in any of the answers:
 - i) Find the Sids of sailors who have reserved a red boat. (02 Marks)
 - ii) Find the names of sailors who have reserved a red boat. (02 Marks)
 - iii) Find the colors of boats reserved by Danny. (02 Marks)
 - iv) Find the names of sailors who have reserved at least one boat. (02 Marks)
 - v) Find the names of sailors who have reserved a red or a green boat. (03 Marks)
 - vi) Find the names of sailors who have reserved both a red and a green boat. (03 Marks)
 - vii) Find the Sids of all sailors who have reserved red boats but not green boats. (03 Marks)
 - viii) Find all Sids of sailors who have a rating of 10 or reserved boat 104. (03 Marks)

PART – B

- 5 a. With illustrative example for each, discuss the following commands used to modify the database:
 INSERT
 DELETE and
 UPDATE (10 Marks)

- b. What are the significant issues in database programming? List and explain the three main approaches to database programming. What are the advantages and disadvantages of each approach? (10 Marks)
- 6 a. What do you mean by functional dependency? What are the possible sources of the information that defines the functional dependencies that hold among the attributes of a relation schema? Explain. (10 Marks)
- b. Discuss the purpose of Boyce-Codd normal form BCNF and describe how BCNF differs from and is stronger than 3NF. Illustrate your answer with an example. (10 Marks)
- 7 a. Write an algorithm to test the non-adaptive join property, and to determine whether functional dependencies are preserved in decomposition. (10 Marks)
- b. Define Join Dependency (JD) and fifth normal form (5NF). (05 Marks)
- c. Write short notes on the following:
- i) Template dependencies
 - ii) Domain-key normal form. (05 Marks)
- 8 a. What are the ACID properties? Explain. (06 Marks)
- b. What is a precedence graph or serializability graph? How is it related to conflict serializability? How is it related to two-phase locking? (06 Marks)
- c. Explain what happens if there are crashes during the undo phase of recovery. What is the role of CLRs? What if there are crashes during the analysis and Redo phases? (08 Marks)
