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B. Tech V Sem. (Main/Back) Exam. Nov-Dec. 2015
Computer Science & Engineering
5CS4A Data Base Management System
Common with IT

Time: 3 Hours

Maximum Marks: 80

Min. Passing Marks Main: 26

Min. Passing Marks Back: 24

Instructions to Candidates:

Attempt any five questions, selecting one question from each unit. All questions carry equal marks. Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly.

Units of quantities used/calculated must be stated clearly.

Use of following supporting material is permitted during examination.

1. NIL

2. NIL

UNIT-I

- Q.1 (a) Explain the advantages of Database Management System over File Management System. [10]
- (b) Give a brief note on the different views of data, with the necessary diagram. [6]

OR

- Q.1 (a) Explain the overall system structure of database management system. [8]
- (b) What is difference between logical data independence and physical data independence? [4]
- (c) Briefly discuss the history of database systems. [4]

UNIT-II

- Q.2 (a) What is Entity Relationship model? How is it useful in designing a real world database? [8]
- (b) Explain ER modelling with the help of database for a Banking Management System. [8]

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OR

- Q.2 (a) Explain the notational conventions used in the ER model. [8]
 (b) Explain network and object oriented model. What are the roles of these models in database design? [4]
 (c) Differentiate between: [4]
 (i) Ternary Relationship and Aggregation
 (ii) Entity and Attribute

UNIT-III

Q.3 Consider the relation schema:

Works (Person_name, company_name, salary)
 Lives (Person_name, street, city)
 Located-in (company_name, city)
 Managers (Person_name, manger_name)

Where manager-name refers to person-name.

Give the relational algebra for the following queries: [16]

- (i) List the names of the persons work for the company 'SBC' along with the cities they live in.
 (ii) Find the name of the persons who live in the same city and same street as their manager.
 (iii) Find the persons whose salaries are more than the salary of every body who works for the company 'SBC'.

OR

Q.3 Discuss the various fundamental operations in relational algebra with suitable example. [16]

UNIT-IV

- Q.4 (a) How would you use the feature of nested queries in SQL to develop complex queries? Give examples. [8]
 (b) What is an Embedded SQL? Explain with an example. [8]

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OR

Q.4 Consider the following tables:

Branch (Branch_No, street, city, pin code)

Staff (Staff_No, Fname, position, sex, DOB, Salary, Branch_No)

Answer the following queries using SQL commands - [4×4=16]

- (i) List all staff with a salary between Rs. 20000 and Rs. 30000 of branch office Delhi or Jaipur.
 (ii) Find the number of staff working in each branch and sum of their salaries.
 (iii) Find all staff whose salary is larger than the salary of at least one member of staff branch 'BO3'.
 (iv) Give all staff a 3% pay increases.

UNIT-V

- Q.5 (a) Why BCNF to be considered stricter than 3NF? Explain decomposition of non-BCNF scheme into BCNF scheme. [10]
 (b) Describe the concept of full functional dependency. [6]

OR

Q.5 (a) Decompose the schema R= (A, B, C, D, E) into (A, B, C) and (A, D, E). Also show that this decomposition is a lossless-join decomposition if the following set

F of functional dependencies holds:

- A→BC, CD→E, B→D, E→A [8]
 (b) Define Functional Dependency. Explain Armstrong's axioms or rules, with examples. [2+6=8]

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