CBCS Scheme

Fifth Semester B.E. Degree Examination, Dec.2017/Jan.2018
Database Management Systems

Time: 3 hrs.   Max. Marks: 80

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

Module-1

1   a. Explain the main characteristics of the database approach versus the file processing approach.   **(08 Marks)**
    b. Explain the three – schema architecture with neat diagram. Why do we need mappings among schema levels? How do different schema definition languages support this architecture?   **(08 Marks)**

OR

2   a. Discuss with examples, different types of attributes.   **(07 Marks)**
    b. Draw an ER diagram for a BANK database schema with atleast five entity types. Also specify primary key and structural constraints.   **(09 Marks)**

Module-2

3   a. Describe the characteristics of relations with suitable example for each.   **(08 Marks)**
    b. What are the basic operations that can change the states of relations in the database? Explain how the basic operations deal with constraint violations.   **(08 Marks)**

OR

4   a. Describe the steps of an algorithm for ER – to – relational mapping.   **(10 Marks)**
    b. In SQL which command is used for table creation? Explain how constraints are specified in SQL during table creation with suitable example.   **(06 Marks)**

Module-3

5   Consider the COMPANY DATABASE
    EMPLOYEE (Fname, Minit, Lname, Ssn, Bdate, Address, Sex, Salary, super-ssn, Dno)
    DEPARTMENT (Dname, Dnumber, Mgr_ssn, Mgr_st_date)
    DEPART_LOCATIONS(Dnumber, Dlocation)
    PROJECT (Pname, Pnumber, Plocation, Dnum)
    WORKS_ON (Essn, Pno, Hours)
    DEPENDENT (Essn, Dependent_name, Sex, Bdate, Relationship).
    Specify the following queries in SQL on the database schema given above :
    a. For every project located in Stafford, list the project number the controlling department number and the department manager's last name, address and birth date. **(04 Marks)**
    b. List the names of all employees who have a dependent with the same first name as themselves.   **(02 Marks)**
    c. For each project, list the project name and the total hours per week (by all employees) spent on that project.   **(04 Marks)**
    d. Retrieve the name of each employee who works on all the projects controlled by 'Research' department.   **(06 Marks)**

OR

6   a.   Define Stored Procedure. Explain the creating and calling of stored procedure with suitable example.   (08 Marks)
    b.   Explain the Single – tier and Client – server architecture, with neat diagram.   (08 Marks)

Module-4

7   a.   Explain the informal design guidelines used as measures to determine the quality of relation schema design.   (08 Marks)
    b.   Define Normal form. Explain 1NF, 2NF and 3NF with suitable examples for each. (08 Marks)

OR

8   a.   Define Minimal cover. Write an algorithm for finding a minimal cover F for a set of functional dependencies E. Find the minimal cover for the given set of FDs be   (08 Marks)
         $E : \{B \rightarrow A , D \rightarrow A , AB \rightarrow D\}$.
    b.   Consider the universal relation R = {A, B, C, D, E, F, G, H, I, J} and the set of functional dependencies   (08 Marks)
         $F = \{\{A, B\} \rightarrow \{C\} , \{A\} \rightarrow \{D, E\} , \{B\} \rightarrow \{F\} , \{F\} \rightarrow \{G, H\} , \{D\} \rightarrow \{I, J\}\}$.
         Determine whether each decomposition has the lossless join property with respect to F.
         $D_1 = \{R_1, R_2, R_3\}$; $R_1 = \{A, B, C, D, E\}$; $R_2 = \{B, F, G, H\}$; $R_3 = \{D, I, J\}$.

Module-5

9   a.   Why Concurrency control is needed demonstrate with example?   (12 Marks)
    b.   Discuss the desirable properties of transactions.   (04 Marks)

OR

10 a.   When deadlock and starvation problems occurs? Explain how these problems can be resolved.   (09 Marks)
    b.   Explain how shadow paging helps to recover from transaction failure.   (07 Marks)

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