CBCS Scheme

USN | | | | | | | | | | |

15CS53

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 →A , D → A , AB → 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} → {C} , {A} →{D, E} , {B} → {F} , {F} → {G, H} , {D} → {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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