

CBCS Scheme



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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

- Explain the main characteristics of the database approach versus the file processing approach. (08 Marks)
 - 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

- Discuss with examples, different types of attributes. (07 Marks)
 - 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

- Describe the characteristics of relations with suitable example for each. (08 Marks)
 - 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

- Describe the steps of an algorithm for ER – to – relational mapping. (10 Marks)
 - 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

- 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 :

- 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)
- List the names of all employees who have a dependent with the same first name as themselves. (02 Marks)
- For each project, list the project name and the total hours per week (by all employees) spent on that project. (04 Marks)
- Retrieve the name of each employee who works on all the projects controlled by 'Research' department. (06 Marks)

OR



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- 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)
