2019

DATABASE MANAGEMENT SYSTEM

Paper : IT 402 (Back)

Full Marks : 100

Time : Three hours

The figures in the margin indicate full marks for the questions.

*Answer **any five** questions.*

1. 5×4=20

(a) What are the foreign key and primary key in a relation, give examples ?

(b) What are the physical and logical data independency ?

(c) What do you mean by regular and weak entity sets, give examples ?

(d) What are the foreign key and merged relation approaches for mapping of binary 1:1 relationship type ?

Contd.

2. 5×4=20

(a) Define schema, instance and database state.

(b) What is an attribute in DBMS ? Define various types of attributes with appropriate examples.

(c) What are the physical, logical and view level data abstraction ?

(d) Discuss various types of join operations.

3. Consider the following relational schema : 20

Employee (Name, SSN, Bdate, Add, Salary, Super-SSN, DNQ)

DEPARTMENT (D Name, DNumber, Mgr-SSN, Mgr-start-date)

DEPT_LOCATION (DNumber, Dlocation)

PROJECT (PName, PNumber, Plocation, DNum)

WORKS-ON (ESSN, PNO, Hours)

DEPENDENT (ESSN, DEName, Bdate, Relationship)

Write relational algebra expression and SQL query for the following :

(i) Retrieve the name and address of all employees who work for the Research department.

(ii) For every project located in Stafford, list the project number, controlling department number and the department manager's name, address and birth date.

(iii) Find the name of all employees who work on all projects controlled by department number 5.

(iv) Retrieve the name of all employees who have no dependent.

(v) List the name of all employees with two or more dependents.

4. (a) Explain Insertion, Deletion and Modification anomalies with proper examples. 10

(b) What is transaction? Mention all desirable properties of transaction. 5

(c) What is normalization? Differentiate between first normal form and second normal form. 5

5. 5×4=20

(a) What is an ER diagram? Discuss the various components of an ER diagram.

(b) Explain the concept of functional dependency with an example.

(c) How to compute closure of set of functional dependency? Explain with suitable example.

(d) Explain the role of database administration.

6. Write short notes on : ***(any four)*** 5×4=20

(i) Specialization and Generalization

(ii) Database users

(iii) Cardinality ratio

(iv) Query optimization

(v) Three-tier architecture.