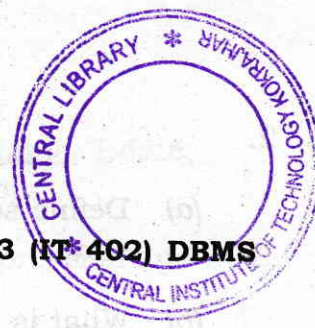


Total number of printed pages-5

53 (IT*402) DBMS



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)

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

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Contd.

- (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. 5x4=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)** 5x4=20

- (i) Specialization and Generalization
- (ii) Database users

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- (iii) Cardinality ratio
- (iv) Query optimization
- (v) Three-tier architecture.

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