53 (EC 813) DBMS

2017

DBMS

Paper : EC 813

Full Marks : 100

Time : Three hours

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

*Answer **any five** questions.*

1. *(a)* Consider the following relation : 10

Car-sale (car#, date-sold, salesman#, commission%, discount-amt).

Assume that a car may be sold by multiple salesmen and hence (car#, salesman#) is the primary key. List out all the possible functional dependencies. Apply normalization until you cannot decompose the relations further.

(b) What is concurrency control ? What are the various locks used to achieve this ? Explain and differentiate.

2+8=10

2. (a) With an example, explain multi-programming and parallel processing.

6

(b) Describe a three-schema architecture.

6

(c) Consider the following relation schema :

2×4=8

employee (emp-id, emp-name, age, salary, dept-no).

department (dept-no, dept-name, mgr-id, location).

project (proj-no, proj-name, location, dept-no).

Write SQLs for :

(i) Get department names of each employee.

(ii) Get the salary of each manager.

(iii) Retrive project details and the respective department name.

(iv) Retrieve total amount of salary drawn by all employees.

3. (a) Define first, second and third normal forms. Differentiate between 3NF and BCNF. 8

(b) Explain different categories of database users. 6

(c) What are the ACID properties of a transaction ? 6

4. (a) Discuss the optimistic concurrency control technique. Name its phases. How is minimum overhead reached ? 10

(b) Consider a database that consists of the following relations :

supplier (sno, sname)

part (pho, pname, color, weight)

project (jho, jname)

shipment (sno, pno, jno, quantity)

Write relational algebra statements for: 2×5=10

(i) Retrieve part details whose weight is more than 150.

(ii) Get supplier names who supply part p5 to project j5.

(iii) Get the part details of those parts supplied by supplier s1.

(iv) List the suppliers who do not supply to project j2.

(v) List the suppliers who supply every project.

5. (a) Draw a relevant ER diagram of your institute taking into account any mini-world situation. 6

(b) What do you mean by deadlock and starvation ? Discuss any deadlock detection scheme. 3+6=9

(c) What is data independence ? 5

6. (a) Explain full functional dependency and transitive dependency with the help of some example. 4+4=8

(b) What is a transaction ? Explain its state transition diagram. 2+7=9

(c) Draw a ternary and binary relationship diagram of supplier, part, project as cited the Q. No. 4.*(b)*. Show the cardinality ratios. 3

7. (a) Discuss entity integrity, Referential integrity and foreign keys. 10

(b) Discuss the characteristics of relations that make them different from table and files. 5

(c) Define the following terms : 1×5=5

(i) degree of a relation

(ii) domain

(iii) attribute

(iv) DDL

(v) relational database schema.
