44 (3) BCA–HC–3036/3·3 (O)

2022

(Held in 2023)

DATABASE MANAGEMENT SYSTEM

Paper : BCA–HC–3036/3.3 (Old Syllabus)

Full Marks : 60 (for CBCS)/ 80 (for Non-CBCS)

Time : Three hours

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

Students of ***CBCS*** *system will attempt* ***six*** *questions and* ***Non-CBCS*** *students will attempt* ***only eight*** *questions from the following.*

1. *(a)* Define the following terms : 1×5=5

   Database, Primary key, Schema, Cardinality, DBMS

   (b) Fill in the blanks : 1×5=5

   (i) The association between *two* entities is called ____ relationship.

Contd.

(ii) The components of ER model are _____.

(iii) BCNF stands for _____.

(iv) DDL stands for _____.

(v) ALTER operation of SQL is used for _____.

2. Answer the following : 2×5=10

(a) Define foreign key. Why is this concept used for ?

(b) Why should we avoid keeping NULL values in the database ?

(c) What is the difference between join and Cartesian product ?

(d) What are the basic data types available for attributes in SQL ?

(e) Define functional dependency. What do you mean by full functional dependency ?

3. *(a)* Consider the following relation : 6

Car_sale (Car#, Salesman#, Date_sold, Commission%, Discount_amt)

Assume that a car may be sold by multiple salesmen, and hence {car#, salesman#} is the primary key.

Additional dependencies are :

Date_sold → Discount_amt

Salesman# → Commission%

Based on the given primary key, is the relation in 1NF, 2NF or 3NF ? Why or why not ? How would you successfully normalize it completely ?

(b) What do you mean by insertion, deletion and updation anomalies ? Why are they considered bad ? 4

4. *(a)* Define data independence. Explain three-level architecture of DBMS briefly. 5

(b) What are the major advantages and disadvantages of DBMS ? 5

5. *(a)* **Consider the following relational scheme and solve queries using relational algebra :**

Employee (ENO, Ename, Salary, Address, Dnumber)
FK

Department (Dnum, Dname, Mgreno)
FK

where,

ENO → Employee number

Mgreno → Manager employee number

Dnum → Department number.

Employee (Dnumber) references Department (Dnum) and

Department (Mgreno) references Employee (ENO).

(i) List the name of managers of each department. 2

(ii) Give the name of employees working in department number 5. 2

(iii) Give the details of employees who are getting salary more than Rs.30,000. 1

(b) What are the major characteristics of DBMS ? 3

(c) Define composite primary key. 2

6. What are the rules to convert ER diagram to tables ? Explain with example. 10

7. (a) Define integrity constraint. Explain the concept referential integrity constraint. 2+4=6

(b) Define natural join. 2

(c) Define first normal form. 2

8. (a) What do you mean by relational algebra ? Explain *any two* oprations with example. 2+4=6

(b) What are strong and weak entities ? Give example. 2

(c) What are fixed length records ? 2

9. *(a)* Consider the following table and solve queries using SQL : 1×5=5

Student (Rollno, student_name, address, date_of_admission, contact_no., class_section)

(i) Give syntax to create the student table.

(ii) To exsert values in the table.

(iii) To list the name of all students having roll no. > 20.

(iv) To change the name of the student whose roll no. is 10 to amar.

(v) To list the name of the students from Guwahati.

(b) What do you mean by storage of databases ? How can we place file records of disks ? 5

10. *(a)* Define entity-relationship diagram. What are the major components of ER diagram ? Give the notations of all components of ER diagram. 2+4+1=7

(b) What are the major responsibilities of DBA ? 3
