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MCA 2nd Semester Examination

Database Management System (CBS)

MCA-202/MCA-C22

Time : 3 Hours **Max. Marks : 60**

The candidates shall limit their answers precisely within the answer-book (40 pages) issued to them and no supplementary/continuation sheet will be issued.

Note : Candidates are required to attempt five questions in all selecting one question from each of the section A, B, C and D. Section-E is compulsory.

SECTION - A

1. (a) Explain the following terms:

   (i) Database Instance

   (ii) Database Schema (6)

   (b) What is DBMS? Explain the advantages and disadvantages of DBMS. (6)

2. (a) Explain the difference between primary key and secondary key with suitable examples. (6)

   (b) Construct an E-R diagram for an car insurance company that has a set of customers, each of whom owns one or more cars. Each car has associated with it zero to any number of recorded accidents. (6)

SECTION - B

3. (a) What are the various anomalies occurred due to multivalued dependency? What are the steps to remove those anomalies? (6)

   (b) Explain the advantages of normalization. (6)

4. (a) Explain the 3NF with the help of example. (6)

   (b) Explain the aggregate functions of SQL. (6)

SECTION - C

5. (a) Explain the purpose of:

   (i) Order by Clause

   (ii) Group by Clause (6)

   (b) What is database security? What are various defense mechanisms? (6)

6. Consider the following two transactions:

   T_1: read(A);

   Read(B);

   If A=0 then B: = B+1

   Write(B);

   T_2: read(B);

   Read(A);

   If B=0 then A:= A+1

   Write(A);

   Add lock and unlock instructions to transaction T_1 and T_2, so that they observe the two phase locking protocol. Can the execution of these transactions result in deadlock? (12)

SECTION - D

7. (a) Explain the advantages of DDBMS. (6)

(b) What is difference between distributed processing and DDBMS? (6)

8. Define fragmentation in DDBMS. Explain the following types of fragmentation with examples:

(i) Horizontal fragmentation.

(ii) Vertical Fragmentation.

(iii) Mixed Fragmentation. (12)

SECTION - E

9. (i) Define degree of relation.

(ii) Write the examples of record based data models.

(iii) Explain the term entity.

(iv) What do you mean by procedural query language?

(v) What is transaction? What are its types?

(vi) Explain the term redundancy. (2×6=12)