Name : ....

Roll No. : ....

Invigilator's Signature : ....

CS/B.TECH(EIE)(N)/SEM-5/EI-504B/2012-13

2012
DATABASE MANAGEMENT SYSTEM

Time Allotted : 3 Hours   *Full Marks :* 70

The figures in the margin indicate full marks.

Candidates are required to give their answers in their own words as far as practicable.

GROUP – A
(Multiple Choice Type Questions)

1. Choose the correct alternatives for the following : 10 × 1 = 10

    i)   The database schema is

        a)   a snapshot of data

        b)   logical design of database

        c)   physical design of database

        d)   a snapshot of database.

    ii)   A join without any condition is called

        a)   Inner join   b)   Outer join

        c)   Equi join   d)   Cross join.

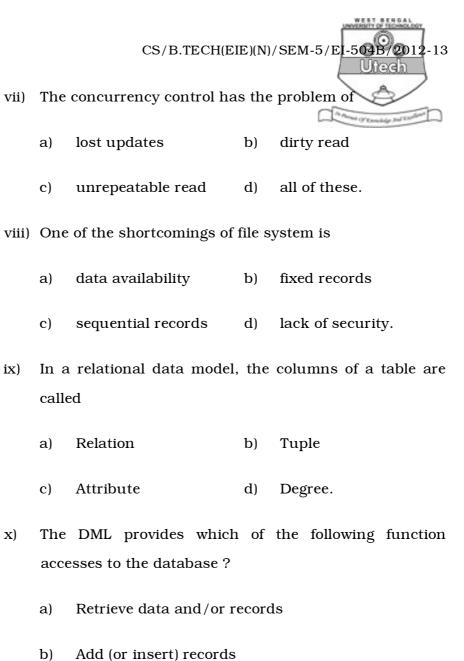5422(N)   [Turn over

iii) Four DDL commands are

   a) SELECT, INSERT, UPDATA, DELETE

   b) CREATE, ALTER, DROP, TRUNCATE

   c) COMMIT, SAVE POINT, ROLL BACK, SET TRANSACTION.

   d) GRANT, REVOKE, CALL, LOCK TABLE.

iv) The common SQL* PLUS command which causes the results of PL/SQL statements to be displayed is

   a) SHOW ERRORS

   b) DESCRIBE

   c) SET SERVER OUTPUT ON

   d) SPOOL.

v) In the E-R diagrams, the term 'cardinality' is synonymous to

   a) Attribute   b) Degree

   c) Entities   d) Cartesian.

vi) 2NF is always in

   a) 1NF   b) BCNF

   c) MVD   d) none of these.

vii) The concurrency control has the problem of

    a) lost updates   b) dirty read

    c) unrepeatable read   d) all of these.

viii) One of the shortcomings of file system is

    a) data availability   b) fixed records

    c) sequential records   d) lack of security.

ix) In a relational data model, the columns of a table are called

    a) Relation   b) Tuple

    c) Attribute   d) Degree.

x) The DML provides which of the following function accesses to the database ?

    a) Retrieve data and/or records

    b) Add (or insert) records

    c) Delete records from database files

    d) all of these.

GROUP – B
(Short Answer Type Questions)
Answer any *three* of the following. 3 × 5 = 15

2. What is E-R Modelling ? Define Attribute in E-R Modelling. Explain Multivalued and Derived attributes with example.

2 + 1 + 2

3. Explain Dense and Sparse indexes. Based on access time and space overhead, which of the indexes is preferable ?

4. What is stored-procedure ? What is the difference between Procedure and Function ? What is trigger and when is it invoked ? 1 + 2 + 2

5. Define BCNF. How does it differ from 3 NF ? Why is it considered a stronger than 3 NF ? 1 + 2 + 2

6. What are ACID properties of a database transaction ? Describe two phase locking protocol. 3 + 2

GROUP – C
(Long Answer Type Questions)
Answer any *three* of the following. 3 × 15 = 45

7. a) Define Database Management system.

   b) Why is it beneficial to store data in a database than a text file in computer ?

c) Draw the ER diagram for a company Database.

(i) Company has a set of Departments

(ii) Each department has a set of Employees and Projects

(iii) An employee may have some dependants.

2 + 6 + 7

8. a) Explain the following terms with examples :

(i) Update anomalies

(ii) Functional dependency

(iii) Armstrong axiom's.

b) Explain briefly different types of Normal form (up to BCNF) with examples.

c) $R = (A, B, C, D)$ and FDs are $F = \{ A \to B, A \to C, C \to D\}$ Consider the decomposition of R into $R1$ (A, B, C) with FD, $F1 = \{ A \to B, A \to C \}$ and $R2$ (C, D) with FD, $F2 = \{ C \to D \}$. Is this decomposition lossless and dependancy presentation. (3 × 2) + 4 + 5

9. Explain with examples the difference between weak and strong entity sets. What is the difference between superkey, candidate key and primary key ? What are the different types of attributes ? Explain with example. What are the different types of database users ? 2 + 3 + 5 + 5

10. Consider the following :

Hotel (hotel no, name, address)

Room (room no, hotel no, type, price_pn).

Booking (hotelno, guestno, datefrom, dateto, room no).

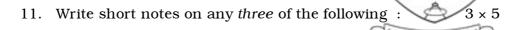Guest (guestno, name, address), where the underline column names are primary keys.

a)   Write down the expression in relational algebra :

   (i)   List all hotels in Kolkata

   (ii)   List all single rooms with a charge below Rs. 1000 per night

   (iii) List the names of all guests who are going to stay at ITC hotel from 25th December to 1st January

   (iv)   List all guests staying at Taj Hotel.

b)   Write down the expression in tuple relational calculus for the following query :

   List name and address of hotels.

c)   Write short notes on integrity constraints . (4 × 2) + 3 + 4

11. Write short notes on any *three* of the following : 3 × 5

    a) Data dictionary

    b) Data abstraction

    c) Query Optimization technique

    d) ACID property

    e) Functional dependency.

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