Name : .....

Roll No. : .....

Invigilator's Signature : .....

CS/B.Tech/CSE(O)/SEM-5/CS-502/2012-13

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) Which is not a function of DBA ?

      a) Schema defination

      b) Gran ing of authorization for data access

      c) Designing security

      d) Defination triggers.

   ii) The entity integrity constraint sates that

      a) no primary key value can be null

      b) a part of the key may be null

      c) duplicate object values are allowed

      d) none of these.

iii) Which one of the following is correct ?

a) All functional dependencies are many-to-many relationships

b) All functional dependencies are many-to-one relationships

c) All functional dependencies are one-to-one-relationships

d) None of these.

iv) What does an attribute mean ?

a) Property of an entity

b) Something about which we collect data

c) Something which relates the existing entities

d) Relation of two entities.

v) Which of the following problems do concurrency controls deal with ?

a) Lost updates

b) Inconsistent retrievals

c) Uncommitted dependency

d) All of these.

vi) In 2-phase lo king a transaction must

a) release all it locks at the same time

b) NOT obtain any new locks once it has started releasing locks

c only obtain locks on items not used by any other transactions

d) ensure that deadlocks will never occur.

vii) Which one of the following is not true about a *B*-tree ?

a) All nodes including the root must be at least half full

b) All leaf nodes must be at the same level

c) All nodes with k keys except the leaves must have $k + 1$ descendents

d) The height of the tree grows when the root splits.

viii) Which one of the following is not an indexing technique ?

a) Primary index b) Secondary index

c) Multilevel index d) Sequential index.

ix) Which one of the following is true about domains in SQL ?

a) SQL domains are user-defined data types

b) SQL domains must be used in data definition

c) SQL domains provide strong typing

d) SQL domains are only synthetic shorthand for system-defined data type.

x) Which one of the following does not always have the same list of attributes that the operands have ?

a) Project b) Select

c) Union d) Difference.

GROUP – B

(Short Answer Type Questions)

Answer any *three* of the following. 3 × 5 = 15

2. Discuss the advantages and disadvantages of using DBMS approach as compared to using a conventional file system. 5

3. Define the concep of generalization, specialization and aggregation. 5

4. What is closure and minimal cover ? What is inclusion dependency ? 3 + 2

5. What is 2-phase locking protocol ? How does it guarantee serializability ? 2 + 3

GROUP – C

(Long Answer Type Questions)

Answer any *three* of the following. 3 × 15 = 45

6. a) Discuss the external view, internal view and conceptual view in three-tier database architecture. How are these different schema layers related to concepts of logical and physical data independence ? 6 + 3

b) Write the difference between procedural and non-procedural DML. 4

c) What do you mean by functional dependency ? 2

7. a) Explain the terms 'partial functional dependency' and 'non-transitive dependency' with example. 4

b) With suitable examples show how recovery in a database system can be done using LOG file with :

i) immediate updation

ii) differed updation. 6

c) What are the ACID properties of a transaction ? Explain. 5

8. a) Define BCNF. How does it differ from 3 NF ? Why is it considered as stronger than 3 NF ? 5

b) What is metadata and wh t is data dictionary ? 5

c) Explain the terms candidate key, primary key, foreign key and super key. 5

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

a) Time-stamp based protocol for concurrency control

b) Wait-Die and wound-wait protocol for dead lock prevention

c) *B* + Tree file organisation

d) Theta-join

e) Armstrong's axioms

f) Insertion and deletion anamalies

g) Vertical and horizontal fragmentation.