**National College of Computer Studies**

**(NCCS-College of IT & Management)**

**Final Terminal Examination (2013)**

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| **BSc.CSIT/ Fourth Semester/ CSC 253: Database Management System** |

***Candidates are required to answer the questions in their own words as far as practicable.***

**Full Marks: 60**

**Pass Marks:30**

**Time: 3 Hours**



**Set A**

**Attempt ALL Questions. [6×10 =60]**

1. Answer following question in short:
   * 1. What is a primary key? Illustrate it with an example. **[2]**
     2. What is a SELECT and Project operation in Relational Algebra? **[2]**
     3. What are the recovery schemes? **[2]**
     4. What is Assertions? Give the syntax of assertions. **[2]**
     5. Name the various privileges in SQL? **[2]**
2. Draw an ER-Model Diagram Cardinalities and attributes for the following:
   1. Consider a car insurance company whose customers own one or more cars each. Each car has associated

with it to zero to any number of recorded accidents. State any assumptions you make. **[6]**

* 1. Define the term ACID with its respective examples. **[4]**

1. Consider the following relations:

Employee (employee-name, street, city)  
Works (employee-name, company-name, salary)  
Company (company-name, city)   
Manages (employee-name, Manager-name)

* 1. Write the SQL statements for the following: **[5]**

Find the name, street address and cities of residence of all employees who works for xyz bank.

Find the name, street address and cities of residence of all employees who works for xyz bank and earn more than Rs. 10000 per annum.

Find the name of all employees who live in same city and on the same street as do their managers.

* 1. What is Normalization? Explain 2NF and 3NF with suitable examples. **[1+4]**

1. **a)** Define Functional Dependencies. List and discuss six inference rules for functional dependencies with

examples. **[1+4]**

* 1. What is Aggregate function in Relational Algebra? Write all the aggregate function in relational algebra with suitable examples. **[1+4]**

1. **a)** With a neat sketch, discuss the states a transaction can be in. **[5]**

**b)** Discuss serializability and conflict serializability with examples.  **[5]**

**6) a)** What do you mean by view? What is the use of view in sql.Write the syntax with relevant example of view.**[5]**

**b)** What is Two phase locking? Give relevant example. **[5]**

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**Set B**

**Attempt ALL Questions. [6×10=60]**

1. **Answer the following questions in short.**
   1. What is a data model? **[2]**
   2. With an example describe what derive attribute is? **[2]**
   3. What is Relationship Instance and Relationship set? **[2]**
   4. What is Check pointing? **[2]**
   5. What is transaction? Explain it with example. **[2]**
2. What is aggregation in an ER model? Develop an ER diagram using aggregation that captures the following information: **[6]** 
   1. Employee works for projects. An employee working for a particular project uses various machineries. Assume necessary attributes. State any assumptions you make. Also Discuss about ER diagram you have designed.
   2. What is Relational Algebra? Discuss the various operations in Relational Algebra. **[4]**
3. Consider the following relations:

Movie (title, year, length, inColor, studioName, producerC#)

StarsIn(movieTitle, movieYear, starName)

MovieStar(name, address, gender, birthdate)

MovieExec(name, address, cert#, netWorth)

Studio(name, address, presC#)

* 1. Write the SQL statements for the following**: [5]**
     1. Find the address of MGM studios.
     2. Find all executives worth at least $10,000,000.
     3. Find all the stars that appear either in a movie made in 1980 or a movie with “Love” in the title.
  2. What is TRIGGER? Explain it with example? **[5]**

1. What is Relational Algebra?

Sailors(sid: integer, sname: string, rating: integer, age: real)

Boats (bid: integer, bname: string, color: string)

Reserves (sid: integer, bid: integer, day: date)

1. Give queries expressed in relational algebra for the following: **[1+4]**
   * 1. Find the name of sailors who have reserved boat no #103.
     2. Find the name sailors who have reserved red boat.
2. All 3NF relations are also in BCNF. Justify the statement with suitable example. **[1+4]**
3. **a)** What is Concurrency control? How concurrency is performed in a transaction with example. **[1+4]**

**b)**What is Schema? Describe the three schema architecture with a neat diagram. **[1+4]**

1. **a)**Write the difference between serial schedule and serializable schedule with example. **[5]**

**b)**Explain Time Stamping based Protocol with example. **[5]**