Roll No: ..... Name .....

National Institute of Technology Calicut

Department of Computer Science & Engineering

CS3002 Database Management Systems

Second MID Term Exam (Monsoon Semester 2016)

Max. Marks: 15 Time: 1hr

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1. State whether the following conclusion are true or false: [1]

   a. NOT (P(x) OR Q(x)) $\Rightarrow$ (NOT (P(x)) AND (NOT (Q(x)))

   b. NOT ($\exists$ x) (P(x)) $\Rightarrow$ $\forall$ x (NOT (P(x))

2. Identify functional dependencies in the following table [1]

A	B	C
a1	b1	c1
a1	b1	c3
a1	b2	c1

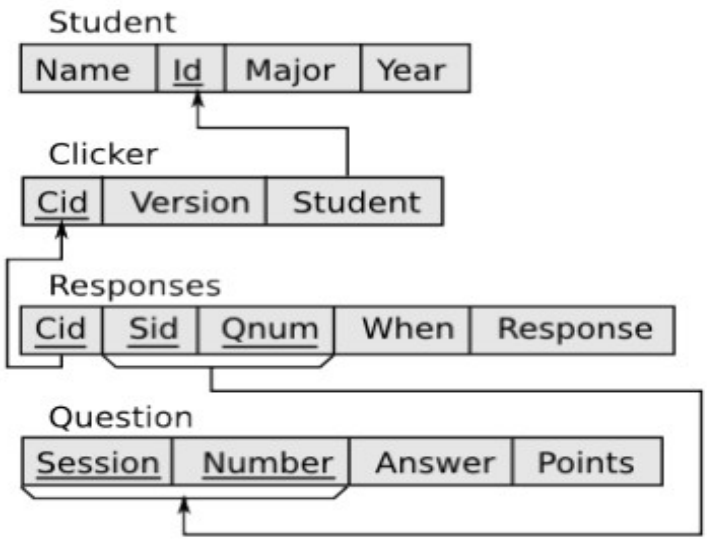
3.Show how you can specify the following relational algebra operations in both tuple and domain relational calculus. [3]

   a. R(A, B, C) MINUS S(A, B, C)

   b. R(A, B) DIVIDE S(A)

4. Consider the Clicker database shown in figure. Express the given query in SQL, relational algebra, Tuple relational calculus and Domain relational calculus [3]

"List the IDs and version numbers of those clickers used to give at least one correct answer during the '24-A-2' session but that are not registered to any student."



5. State and Prove pseudotransitive rule of Functional Dependencies. [2]

6. Consider the relation R= { Course_no, Offering_deptNo, Offering_deptName, Instructor_ssn, Semester, Year,Address, Room_no, Building_Name, Room_Size }

Besides you have the following functional dependencies:

{ Course_no} -->{ Offering_deptNo}

{ Offering_deptNo}-->{ Offering_deptName}

{ Course_no, Semester , Year}--> {Address, Room_no , Instructor_ssn}

{Building_Name} --> {Address}

Try to determine which sets of attributes form keys of R. How would you normalize this relation? [3]

7. Consider the relation : BOOK (Book_Name , Author , Edition , Year) with the data: [2]

Book_Name	Author	Edition	Copyright_Year
DB_fundamentals	Navathe	4	2004
DB_fundamentals	Elmasri	4	2004
DB_fundamentals	Elmasri	5	2007
DB_fundamentals	Navathe	5	2007

a. Is there exist any MVD in the BOOK relation? then list it.

b. If any MVD exist then what would be the decomposition of this relation based on that MVD? Evaluate each resulting relation for the highest normal form it possesses.