**JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT**

TEST - 2

3rd SEMESTER 2012 (BTech – CSE / ICT)

**Course Code: 11B11CI312** **Time: 90 minutes**

**Course Name: DBMS** **MM: 25 Marks**

**Course Credits: 3**

*Note: All questions are compulsory. Specify assumptions made, if any.*

**Section – A (Objective Type: 1 + 1 + 2 + 1 + 2 = 7 marks)**

**Q 1.** Answer briefly and to the point.

(a) The two integrity rules are Domain Integrity and Referential Integrity. Show using an example, the anomalies that may occur when these integrity rules are violated.

(b) Prove using an example that natural join implies a select operation on a Cartesian product.

(c) Consider the following two sets of functional dependencies:
F = { A → C, AC → D, E → AD, E → H} and G = {A → CD, E → AH}.
Check whether they are equivalent.

(d) Prove that any relation schema with two attributes is in BCNF.

(e) Consider a relation R(A, B, C, D, E) with the following dependencies:
AB → C, CD → E, DE → B
Is AB a candidate key of this relation?. If not, is ABD ? Justify your answer.

**Section – B (Conceptual based: 2 * 3 = 6 marks)**

**Q2.** Explain what is meant by repetition of information and inability to represent information? Explain why each of these properties may indicate a bad relational database design.

**Q 3.** Differentiate between :

(a) JDBC and ODBC (b) Embedded SQL and Dynamic SQL

**Section - C (Analytical Ability based: 2 * 3 = 6 marks)**

**Q 4.** Suppose that we decompose the schema ***R* = (*A*, *B*, *C*, *D*, *E*)** into **(A, B, C) and (A, D, E).** Show that this is a lossless-join decomposition if the following set *F* of functional dependencies holds: **A → BC, CD → E, B → D and E → A**

**Q 5.** Compute the closure of the following set F of functional dependencies for relation schema **R (A, B, C, D, E)** where **A → BC, CD → E, B → D and E → A.** Also, List candidate keys of R.

**Section - D (Application based: 6 marks)**

**Q 6.** Using the relation schema given below, answer the following using SQL and Relational algebra:

| **Table: Student** | **Table: Faculty** | **Table: Course** | **Table: Enrollment** |
|---|---|---|---|
| SID Char 9 Not Null<br>Sname Char 25 Not Null<br>Sex Char 1 Not Null<br>Major Char 6 Null<br>CGPA Decimal 10, 2 Null | FID Char 9 Not Null<br>FName Char 25 Not Null<br>Ext Char 3 Null<br>Dept Char 6 Null<br>Rank Char 4 Null<br>Salary Decimal 10, 2 Null | Course_No Char 6 Not Null<br>Cname Char 25 Not Null<br>Credit Char 1 Null<br>Maxenrl Integer Null<br>FID Char 9 Null | CourseNo Char 6 Not Null<br>SID Char 9 Not Null<br>Grade Char 2 Null |

(a) List faculty members who are not involved in teaching any course this term.

(b) Update the salary of faculty from Marketing Department by 10%.

(c ) Delete all the faculty names of R & C department who are "Teaching Assistants" (Rank is 'TA' )



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