

BITS Pilani, Hyderabad Campus
Mid-Semester Test (Regular Exam (Closed Book))

Course No.: CSF212
Duration: 90 Mins

Course Title: Database Systems
Date: 12-03-2019

Max. Marks: 100(25%)
Time: 09:00 AM - 10:30 AM

Note 1: Read and FOLLOW Instructions to candidates on 1st page of your answer script.

Note 2: Answer all subparts of a question together.

<p>Q1:A: Match the Following [4 Marks]</p> <table> <tr> <td>a. 2 NF</td> <td>1. Transitive dependency</td> </tr> <tr> <td>b. 3 NF</td> <td>2. Multivalued Dependencies</td> </tr> <tr> <td>c. 4 NF</td> <td>3. Join Dependencies</td> </tr> <tr> <td>d. 5 NF</td> <td>4. Partial dependency</td> </tr> </table>	a. 2 NF	1. Transitive dependency	b. 3 NF	2. Multivalued Dependencies	c. 4 NF	3. Join Dependencies	d. 5 NF	4. Partial dependency	<p>Q1:B: Find out the set of FDs for the relation R(ABCD) with primary key AB and under which R is in 2 NF but not in 3NF [4 Marks]</p> <p>a $AB \rightarrow CD, B \rightarrow C, C \rightarrow B, A \rightarrow D$</p> <p>b $AB \rightarrow CD, A \rightarrow C, C \rightarrow D$</p> <p>c $AB \rightarrow CD, C \rightarrow D, DB \rightarrow AC$</p> <p>d $AB \rightarrow CD, BC \rightarrow D$</p>
a. 2 NF	1. Transitive dependency								
b. 3 NF	2. Multivalued Dependencies								
c. 4 NF	3. Join Dependencies								
d. 5 NF	4. Partial dependency								
<p>Q1:C: A relation R is defined with attributes NAME(unique), Street, City, State, and Pin. For each pin, there is only one city and state. Also, for any combination of street, city and state, there is only one pin. The highest normal form of the relation is: [4 Marks]</p>	<p>Q1:D: Consider relation schema R(ABCD) with set of FDs ($A \rightarrow B, B \rightarrow C, C \rightarrow D, D \rightarrow A$) The decomposition of R into R1(AB), R2(BC), R3(CD) is [3 Marks + 3 Marks]</p> <p>a. Dependency preserving or not</p> <p>b. Lossless or Lossy</p>								
<p>Q1:E: Determine True or False for the statement [2*5=10 Marks]</p> <p>a. A relation may have a number of candidate keys, but has only one primary key.</p> <p>b. Every table with 2 single valued attributed is in 1NF, 2NF, 3NF, and BCNF</p> <p>c. A table is in 2 NF if every attribute is determine by every candidate key, but is not determine by any pure subset of a candidate key.</p> <p>d. In the basic ER Diagram, an attribute of an entity can have more than one value.</p> <p>e. a row of a relational table, an attribute can have exactly one value or a NULL value</p>	<p>Q1:F: What is the min and max number of tables required to convert an ER diagram with 2 entities and 1 relationship between them with [3*4=12 Marks]</p> <p>a. One to One with Partial participation constraints of both entities (Null value not allowed)</p> <p>b. One to one with Total participation constraints of both entities (null value not allowed)</p> <p>c. One to many with Partial participation constraints of both entities (Null value allowed)</p> <p>d. Many to Many Total participation constraints of both entities (null value not allowed)</p> <p>Q1:G: Let M and N be two entities in an E-R diagram with simple single value attributes. R1 and R2 are two relationship between M and N, where as R1 is one-to-one and R2 is one-to-many. The minimum number of tables required to represent M, N, R1 and R2 in the relational model are [4 Marks]</p>								

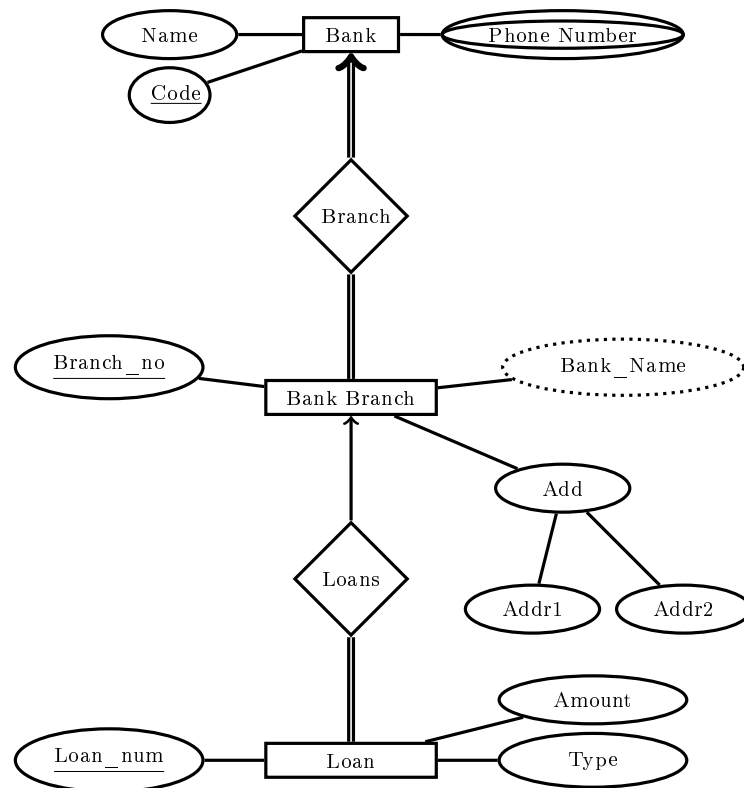
Q2:A: Consider the following requirement: [10 Marks]

1. Each supplier has a unique name.
2. More than one supplier can be located in the same city.
3. Each part has a unique part number.
4. Each part has multiple colors.
5. A supplier can supply more than one part.
6. A part can be supplied by more than one suppliers.
7. A supplier can supply fixed quantity of each part.

To create ER diagram answer the following questions:

- Find out the entities in the above specifications.
- Find out the relationships among the entities.
- Find out the constraints between entities and relationships.
- Draw the ER diagram.
- Define the relational schema for your ER diagram. Underline the primary keys.

Q2:B: Consider the following ER diagram. [8 Marks]



Define the relational schema for above ER diagram. Underline the primary keys.

Q3:A: Given a schema R(A, B, C, D, E), and the following set of FDs (A→BC,B→D,E→A,CD→EA,A→D)

- A. Compute the canonical cover for FDs. [4 Marks]
- B. What are the candidate keys of R? [3 Marks]
- C. What is the highest normal form? [3 Marks]
- D. Decompose R into BCNF using BCNF decomposition rule. [6 Marks]
- E. Prove that your decomposition is a lossless join. [4 Marks]
- F. Show that your decomposition is dependency preserving or not. [4 Marks]
- G. Decompose R into 3NF using 3NF decomposition rule. [6 Marks]

Q3:B: Consider the following relation schema: Suppliers(sid,sname,address), Parts(pid, pname, color), Catalog (sid,pid,cost) [4 Marks +4 Marks]

- Write SQL query to find the sname of the supplier who supply every red color part.
- Write SQL query to display sname, pname and cost of the product whose cost is greater than 1500.