CSC380: Principle of Database   Instructor: Dr. Touir Ameur
Midterm1 Exam   Monday: 17/6/'36 (6/4/'16) Time: 2 H
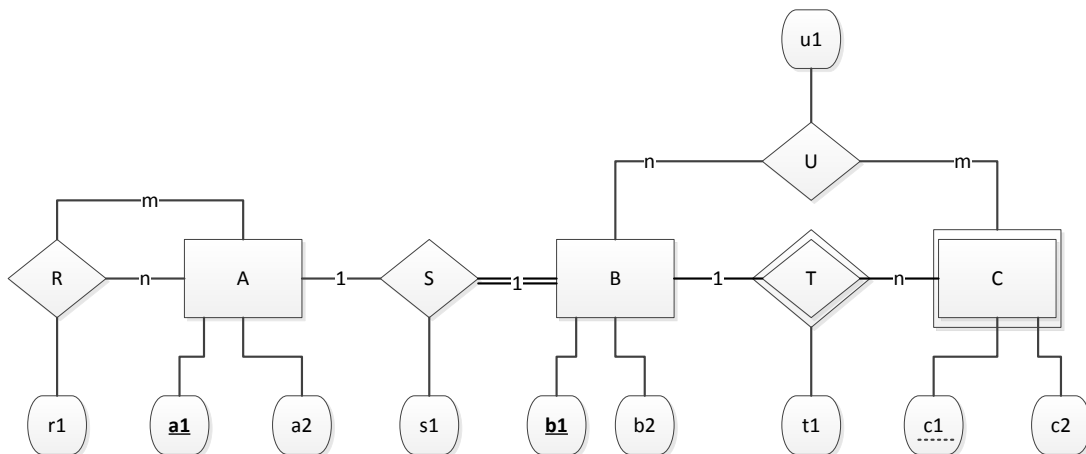
Question 1: (7 Marks)

Map the following ER diagram into a relation schema. Show the different constraints.

Question 2: (5 Marks)

1. What does total participation mean?

2. A foreign key may be duplicated and may be unique.

    a. In which case it can be duplicated?

    b. In which case it must be unique?

    c. In which case it must be not null?

3. What is the relationship between relational algebra and relational language

Question 3: (8 Marks)

Given the following schema :
          Borrower(SId, name, age)
          Copy_Book(isbn, copy#, title, author, publisher, keywords)
          Borrow(Sid, isbn, copy#, date)

Write down the following queries in **relational algebra** and in **SQL** :

1. Retrieve database books.

2. Retrieve all database books borrowed by "Ahmad AlSanea"

3. Retrieve the books that were not borrowed

4. Retrieve the number of database, network, and security books