



**Kiriri Women's University of Science and Technology**

**End of first trimester 2019 examinations**

**KBI 2203 : Database Systems**

**April 2019**

**Time: 2hrs**

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**INSTRUCTIONS:** Answer Question **ONE** and any other **TWO** questions.

**Question ONE (30 marks)**

- a) Explain any four characteristics of a database system. **(4 Marks)**
- b) Describe the impact of data redundancy on database **(4 Marks)**
- c) Explain the role played by the following database users in a typical organization. **(9 Marks)**
  - (i) Database administrator:
  - (ii) Database designer:
  - (iii) End users
- d) Describe the main phases of database development lifecycle **(5 Marks)**
- e) XYZ Co Ltd has invited you to orientate its newly recruited database administration personnel in matters pertaining to its databases. Comment on the types of integrity constraints that will be established. **(3 Marks)**
- f) Describe the characteristics of a table in an unnormalized form (UNF) and explain how the table is converted to a First Normal Form (1NF) relation. **(5 Marks)**

**QUESTION 2**

- a) Database systems are usually implemented to counter some of the disadvantages of traditional file processing systems such as data redundancy. Discuss any five characteristics of database management systems in this context **(10 Marks)**
- b) Explain four properties of a transaction as used in database management systems **(8 Marks)**

- c) Differentiate between a master file and a transaction file as used in database systems. **(2 Marks)**

**QUESTION 3**

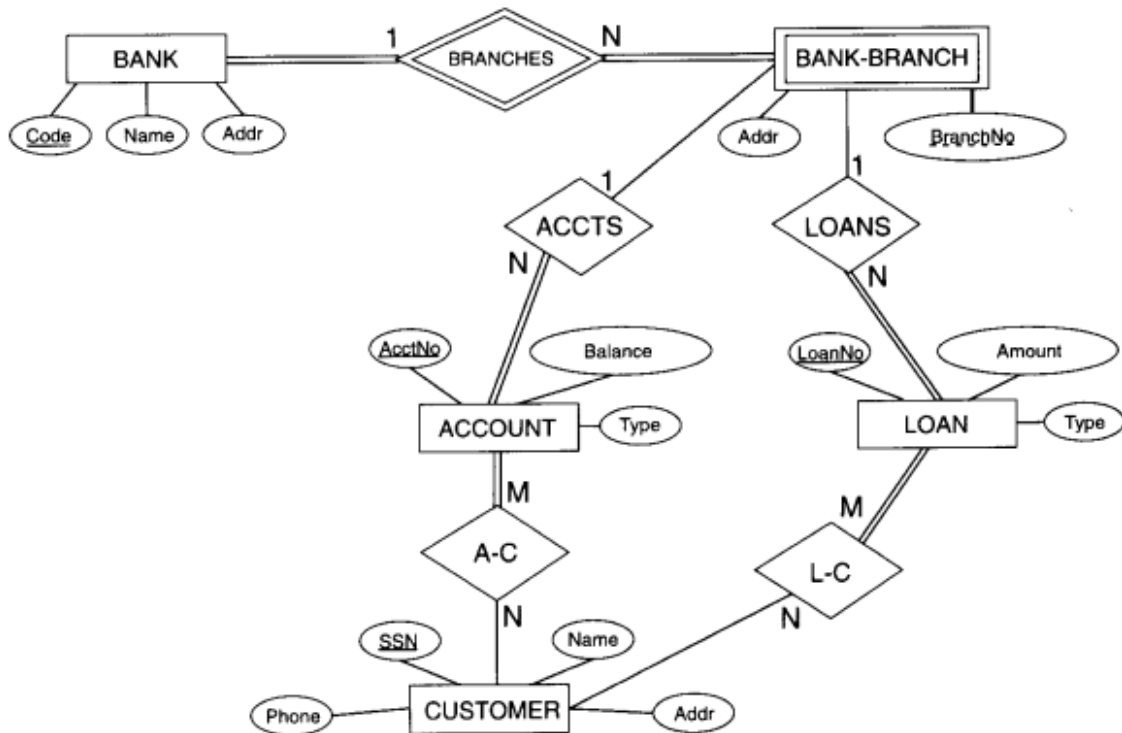
- a) Wanjeshi Sacco Ltd. is intending to introduce a corporate database to support a variety of its information needs.

- i. List two organizational, technical and human factors to be considered in the process of establishing the corporate database environment. **(6 Marks)**
- ii. Propose two database models that can act as design alternative options. **(2 Marks)**
- iii. Explain four database areas in which the company would be justified in restricting employee access. **(8 Marks)**

- b) Differentiate between relational and network database models. **(4 Marks)**

**QUESTION 4**

- a) The ER model below describes the requirements of a database for a Bank with branches across the country.



(i) Map the Entity relationship diagram to a relational schema. Indicate the primary keys (underlined) and the foreign (double underlined) in your schema. **(10 Marks)**

b) Explain any three types of attributes a database designer may encounter when drawing Entity Relationship Diagram **(6 Marks)**

c) Differentiate between update and insertion anomaly **(4 Marks)**

### Question 5

a. IEBC wants to store the following voter information on a database

#### Registration center table

- a. Registration center id (primary key)
- b. Center name
- c. County
- d. Constituency
- e. Ward

#### Voters table

- f. Voter id (primary key)
- g. Registration center id (foreign key)
- h. National id
- i. Names
- j. Registration Date

Write the SQL statement to perform the following tasks

i. Create the tables shown above

**(3 marks)**

ii. Insert the following details into each table

- **Registration center table**

- i. Id: 14045
- ii. Center name: Mbaraki primary school
- iii. County: Mombasa
- iv. Constituency: Mvita
- v. Ward: Mji wa kale

- **Voters table**

- i. Voter id: 140450001
- ii. Registration center id: 14045
- iii. National id: 22222222
- iv. Names: Juma Mnene Mkonde
- v. Registration Date: today

**(3 marks)**

- iii.** Display the names of all voters and the name of the center they registered **(4 marks)**
  - b.** Explain any five Codd's rules for a relational database model **(10 Marks)**