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**GARISSA UNIVERSITY**

**UNIVERSITY EXAMINATION 2020/2021 ACADEMIC YEAR TWO**

**SECOND SEMESTER EXAMINATION**

**SCHOOL OF PURE AND APPLIED SCIENCES**

**FOR THE DEGREE OF BACHELOR OF INFORMATION SCIENCE**

**COURSE CODE: INS 211**

**COURSE TITLE: DATABASE CONSTRUCTION**

**EXAMINATION DURATION: 2 HOURS**

**DATE: 18/08/2021 TIME: 3.00-5.00 APM**

**INSTRUCTION TO CANDIDATES**

* **The examination has FIVE (5) questions**
* **Question ONE (1) is COMPULSORY**
* **Choose any other TWO (2) questions from the remaining FOUR (4) questions**
* **Use sketch diagrams to illustrate your answer whenever necessary**
* **Do not carry mobile phones or any other written materials in examination room**
* **Do not write on this paper**

**This paper consists of THREE (3) printed pages *please turn over***

**QUESTION ONE (COMPULSORY)**

1. Define the following terms as used in database systems: **(5 Marks)**
   1. Data
   2. Record
   3. Relation
   4. Database
   5. DBMS
2. Distinguish between the following roles in DBMS; Data Administrator and Database Administrator. **(2 marks)**
3. Discuss the term constraints as applied in databases **(2 marks)**
4. Outline any four application areas where databases are highly used. **(4 marks)**
5. Outline any **three** limitations of using the file system approach in data storage and management. **(6 marks)**
6. Explain the following terms as used in SQL
7. Union
8. Not null  **(4 marks)**
9. Giving an example in each case, discuss the following.
10. Relationship
11. Degree of a Relationship
12. Cardinality: **(6 marks)**

**QUESTION 2**

1. Briefly describe Hierarchical, network and relational database models. **(6 Marks)**
2. Discuss any four shortcomings of the traditional data storage before introduction of computers. **(4 marks)**
3. What are the different database languages explain with example. **(6 marks)**
4. Elucidate the ACID property of database management systems  **(4 Marks)**

**QUESTION 3**

Consider the case study of an insurance company. A basic part of the database of the insurance

company is likely to be organised in the following fashion:

Policies(policyNo, holderNo, startDate, premium, renewalDate, policyType)

PolicyHolders(holderNo, holderName, holderAddress, holderTelno)

1. Create two SQL data structures (tables) for the above part of the insurance company database. **(8 Marks)**
2. Write an SQL statement to add a record in the PolicyHoldes Table. **(3 Marks)**
3. Write an SQL statement to change the address of a particular Policy holder to – P.O. Box 283712, Nairobi. **(3 Marks)**
4. Write an SQL statement to count the Type of Policies that are there. **(3 Marks)**
5. Write an SQL statement to remove Policies the table from the database. **(3 Marks)**

**QUESTION 4**

1. Explain how entity integrity is implemented in a relational DBMS **(3 Marks)**
2. Explain how referential integrity is implemented in a relational DBMS **(3 Marks)**
3. In terms of the DBMS interface (sub-language), expand the following terms and state what they are used for:
4. DDL **(3 Marks)**
5. DCL **(3 Marks)**
6. DML **(3 Marks)**

DML – data manipulation language, used to implement the CRUD

1. Briefly describe the difference between a database and a database management system. **(5 Marks)**

**QUESTION 5**

1. Define the term normalization. Explain why normalization is performed during the design of a relational database. **(6 Marks)**
2. Describe the benefits of relational data analysis. **(3 Marks)**
3. Removing repeating groups from data items converts to First Normal Form. Describe the process of converting data already in First Normal Form to Second Normal Form. **(4 Marks)**
4. Explain how entity relation diagrams can assist in the development of a database system. (4 Marks)
5. Using a diagram, explain the difference between an optional relationship and a recursive relationship. **(4 Marks)**