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**University Examinations 2015/2016**

FIRST YEAR, SECOND SEMESTER EXAMINATION FOR THE DIPLOMA IN INFORMATION TECHNOLOGY

**CIT 2150: DATABASE DESIGN AND MANAGEMENT**

**DATE: NOVEMBER 2015 TIME: 11/2 HOURS**

**INSTRUCTIONS:** *Answer question* ***one*** *and any other* ***two*** *questions*

**QUESTION ONE (30 MARKS)**

1. Explain any **THREE** advantages of using a database instead of the traditional file processing system when storing data (6 Marks)
2. Using relevant examples, explain the meaning of the following terms as used in databases

 (6 Marks)

1. Entity
2. Record
3. Data redundancy
4. A university stores data about its students in a table named student as shown below.

|  |  |  |  |
| --- | --- | --- | --- |
| Stu-Reg No | Stu- Name | Stu-Address | Stu-Depart |
| CIT001 | Peter | 10, Meru | IT |
| BUS002 | Mary | 11, Nairobi | BUS |
| AGR003 | Tom | 12, Michagan | AGR |

1. Write an SQL query to show the registration number and name of all students in the IT department (2 Marks)
2. Represent the table using a relational scheme (2 Marks)
3. The relational database model represents data in two dimensional tables. Mention any THREE characteristics of relational tables (3 Marks)
4. Describe five main functions of a database administrator (5Marks)
5. State **THREE** data anomalies that are likely to arise from data redundancy (3 Marks)
6. What is the pu rpose of business rules in regard to database design? (3 Marks)

**QUESTION TWO (15 MARKS)**

1. From a management point of view, the database environment is composed of different components. Describe any **FOUR** (8 Marks)
2. A SACCO stores information about its customers. For each, it stores customer’s name, ID, address and Telephone number. Each customer can operate one or more accounts and the same account can be operated by more than one customer. Accounts have an account number, balance and branch where it was opened. Each branch has a branch number, name and address.

i)Identify the entities in the data (2 Marks)

ii) Represent the data in a relational database using tables (5 Marks)

**QUESTION THREE (15 MARKS)**

1. Describe the following database language (6 Marks)

i) Data definition language

ii) Data manipulation language

1. Data control language
2. Kenya Football Federation (KFF) needs a database to help manage its operations. Data needs to be kept on each football team playing in the league. Each team has a name and team color. Teams have a home stadium, players and a coach but a team may not have a coach. Important details about players and coaches are licence number, name, age and address. Details about a stadium are name, capacity and the town it is located. Some players have a manager who is identified by an ID, name and telephone number. A manager can manage more than one player.

Create an entity relationship diagram to represent the data (9 Marks)

**QUESTION FOUR (15 MARKS)**

1. By use of examples, differentiate the following terms (6 Marks)

i) Weak and strong entity

ii) Composite and derived attribute

1. Foreign and primary key
2. A bank stores data about its employees who work in various branches in the table shown below.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Empty No | Branch No | Branch No | Empty No | Empty No | Emp Pos | Hrs/Week |
| 001 | B001 | Meruj | 0721111,0733338 | Tom | Manager |  |
| 002 | B002 | Nairobi | 0729777 | Mary | Teller |  |
| 003 | B003 | Kisumu | 071899,0734555,07899999 | Peter | Teller |  |

Normalize the table to be in second normal form (9 Marks)

**QUESTION FIVE (15 MARKS)**

1. State and explain the steps involved in the designing of a database (10 Marks)
2. The following is an insurance database

driver (driver ID, name, address)

car (reg.No, make, year, color)

accident (report Number, date, location)

owns (driver ID, reg. No)

participated (driver ID, reg. No, report Number, damage Amount)

Write an SQL statement that will do each of the following tasks

i)Create the database (1 Mark)

ii) Create the driver table (2 Marks)

iii)Modify the database so that the address of the driver with driver ID D001 is now 10, Meru (2 Marks)