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**University Examinations 2015/2016**

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

**CIT 2103: DATABASE SYSTEMS**

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

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

**QUESTION ONE (30 MARKS)**

1. Define the following terms as used in database systems:
2. Relation (1 Mark)
3. Entity relationship model (1 Mark)
4. Normalisation (2 Marks)
5. Differentiate the following as used in database systems:
6. Entity integrity and Referential integrity (2 Marks)
7. Data Security and Data integrity (2 Marks)
8. Weak entity set and strong entity set (2 Marks)
9. State the three properties of database relations (3 Marks)
10. State the three built-in MySQL aggregate functions (6 Marks)
11. Consider the insurance database below, where the primary keys are underlined.

Person (driver-id, name, address)

Car (license, model, year)

Owns (driver-in, license)

Construct the following SQL queries for this relational database.

1. Create a database called insurance (2 Marks)
2. Create the person, car and owns table (3 Marks)

**QUESTION TWO (15 MARKS)**

1. Outline three database models (3 Marks)
2. Describe two advantages and one disadvantage of Normalization. (6 Marks)
3. Describe three Relational Keys used in databases. (6 Marks)

**QUESTION THREE (15 MARKS)**

1. Describe three features of an electronic database management system. (6 Marks)
2. You are instructed to develop a database system to store the information of students in an institution.

i)Name six (6) attributes/fields needed for the system (6 Marks)

ii) Identify the primary key which can be used to differentiate between the students. (3 Marks)

 **QUESTION FOUR (15 MARKS)**

1. Differentiate between relationship and relationship set as used in databases. (2 Marks)
2. Given the customers table below

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Customer\_id | Firstname | Lastname | Date\_of birth | city | phone |
| 001 | Mary | Wambui | 1999-09-07 | Nairobi | 09876543 |
| 002 | Ken | Kamau | 1988-09-04 | Meru | 09899900 |
| 003 | Martin | Mugambi | 1989-04-06 | Nyeri | 45337788 |

 Write MySQL statements do the following;

1. Create the table above with the records. (4 Marks)
2. Retrieve customer\_id, firstname and lastname from the customers table. (3 Marks)
3. Update customers table so that Mary’s last name is Wangechi. (3 Marks)
4. Add another column called order\_id to the customers table. (3 Marks)

**QUESTION FIVE (15 MARKS)**

1. Outline the components of an ER diagram. (3 Marks)
2. Explain the importance of using a Database management system for storage of files in an organization. (6 Marks)
3. Explain three MySQL integrity constraints. (6 Marks)