# Merrifield Preparatory School & College

## GRADE 12 INFORMATION TECHNOLOGY

## NORMALISATION TEST 2019

**Name:_____**

**Examiner: MB**

**Moderator: JM**

**Time: 45 minutes** **Marks: 40**

**Scenario:**

Assume a video library maintains a database of movies rented out. Without any normalization, all information is stored in one table as shown below.

| Full Names | Physical Address | Movies rented | Salutation | Category |
|---|---|---|---|---|
| Janet Jones | First Street Plot No 4 | Pirates of the Caribbean, Clash of the Titans | Ms. | Action, Action |
| Robert Phil | 3rd Street 34 | Forgetting Sarah Marshal, Daddy's Little Girls | Mr. | Romance, Romance |
| Robert Phil | 5th Avenue | Clash of the Titans | Mr. | Action |

1) **Normalisation** can be seen as a process for assigning attributes to entities to prevent poor table structure in a database.
   a) Indicate two objectives/aims which you can achieve with Normalisation. [2]

2) Keys:

a) What is a primary key? [2]

b) Give two attributes of a primary key. [2]

c) Why is it not a good idea to make the **Full Names** the primary key in the above table? [1]

d) Explain why **Full Names** could be referred to as **non-Atomic data.** [1]

e) What is a composite key? [2]

f) Give another term/name for a composite key. [1]

g) Which fields in the above table could you select as a composite key? [2]

h) Selecting a composite key is the first step of putting the table in First Normal Form(1NF)
What would be the next step to put the table in 1NF? [2]

3) **Anomalies**:

a) Briefly explain what an Anomaly is? [2]

b) Name and explain the different anomalies that can occur in a database. [6]

**4) The following is a suggestion of putting the data into 2NF.**

We have introduced a new column called MEMBERSHIP_ID which is the primary key for table 1. Records can be uniquely identified in Table 1 using MEMBERSHIP_ID

**Table 1:**

| MEMBERSHIP ID | FULL NAMES | PHYSICAL ADDRESS | SALUTATION |
|---|---|---|---|
| **1** | Janet Jones | First Street Plot No 4 | Ms. |
| **2** | Robert Phil | 3rd Street 34 | Mr. |
| **3** | Robert Phil | 5th Avenue | Mr. |

**Table 2:**

| MEMBERSHIP ID | MOVIES RENTED |
|---|---|
| **1** | Pirates of the Caribbean |
| **1** | Clash of the Titans |
| **2** | Forgetting Sarah Marshal |
| **2** | Daddy's Little Girls |
| **3** | Clash of the Titans |

a) What are the rules for 2NF? [2]

5) Name and explain the **two types of dependencies** which we are concerned about when we consider 2NF and 3NF. [4]

6) In Table 2 above, MEMBERSHIP_ID is the **Foreign Key**.
   *a)* Name one purpose/function of a foreign key? [1]

7) Third Normal form(3NF)
   a) What steps are required to put the data in 3NF? [2]

   b) Explain, with reference to the fields in **Table 1** above which dependency may still exist. [2]

   c) Rewrite, using relational notation a solution of tables in third normal form. [6]

**[Total 40 marks]**