

# 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	3 <sup>rd</sup> Street 34	Forgetting Sarah Marshal, Daddy's Little Girls	Mr.	Romance, Romance
Robert Phil	5 <sup>th</sup> 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]

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2) Keys:

a) What is a primary key? [2]

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

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

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

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e) What is a composite key? [2]

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

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

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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]

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3) **Anomalies:**

a) Briefly explain what an Anomaly is?

[2]

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

[6]

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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	3 <sup>rd</sup> Street 34	Mr.
3	Robert Phil	5 <sup>th</sup> 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]

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

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

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

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

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

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**[Total 40 marks]**