Time limit : 30 minutes

## Section 1

1. What does the acronym SQL stand for?
   1. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
2. Given tblHomeFloorSurfaceArea(Address, KitchenSurface, LoungeSurface, BathroomSurface) how would you normalize this table to 2NF?
   1. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
3. Given tblPrices(id, name, level, price) which column should be a primary key
   1. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
4. Based on tblPrices in Q3, observing the names of the columns; what data types will you expect them to be defined as.
   1. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
5. What is the difference between a primary-key and a foreign-key?
   1. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
6. State one of the aspects of a relational database
   1. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

## Section 2

For this section; refer to the tables at the end of the document and formulate SELECT queries that will answer each of the below questions

1. List the content of the Gender table
   1. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
2. List the name and isbn for all the books in the library and sort them by name in ascending order
3. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
4. List the student names that are above 24 years of age.
5. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
6. List the student names and ages that are between 20 and 23 years old.
7. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
8. How many books are listed in the library?
9. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
10. How many students are there, based on gender?
11. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
12. List the books in the order of popularity (based on how many books have being checked out).
13. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
14. How many “To Kill A Mockingbird” books have being checked out by Female students?
15. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Data tables;

* + 1. Students.Gender references Gender.id
    2. StudentBooks.LibraryId references Library.id
    3. StudentBooks.StudentId references Students.id

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **StudentBooks** | | |  | **Students** | | | |  | **Gender** | |
| id (PK) | LibraryId (FK) | StudentId (FK) |  | id (PK) | Name | Age | Gender (FK) |  | id (PK) | Type |
| 1 | 1 | 1 |  | 1 | John | 23 | 1 |  | 1 | Male |
| 2 | 3 | 1 |  | 2 | Thabo | 21 | 1 |  | 2 | Female |
| 3 | 4 | 1 |  | 3 | Sinawo | 22 | 1 |  |  |  |
| 4 | 4 | 5 |  | 4 | Lenny | 19 | 1 |  |  |  |
| 5 | 4 | 8 |  | 5 | Wendy | 22 | 2 |  |  |  |
| 6 | 5 | 8 |  | 6 | Logan | 22 | 1 |  |  |  |
| 7 | 3 | 3 |  | 7 | Thabo | 27 | 1 |  |  |  |
|  |  |  |  | 8 | Thandi | 25 | 2 |  |  |  |
|  |  |  |  | 9 | Lucky | 24 | 1 |  |  |  |
|  |  |  |  | 10 | Vince | 20 | 1 |  |  |  |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Library** | | | | |
| id (PK) | Name | ISBN | Author | Category |
| 1 | Old man and the sea | 123-AA-32377 | Hemingway, Ernest | Fiction |
| 2 | The nature of the Universe | 123-AA-32378 | Gallant, Roy A | Science |
| 3 | The Great Gatsby | 374-DC-23056 | F. Scott Fitzgerald | Novel |
| 4 | To Kill A Mockingbird | 939-MA-4456 | Harper Lee | Novel |
| 5 | Hitch Hikers Guide To The Galaxy | 001-AA-3902 | M. J. Simpson | Fiction |

CREATE TABLE Students(

id INTEGER NOT NULL PRIMARY KEY,

Name TEXT ,

Age INTEGER,

GenderID INTERGER NOT NULL REFERENCES Gender);

INSERT INTO Students VALUES(1,"John", 23, 1),

(2 , "Thabo", 21, 1),

(3 , "Sinawo", 22 ,1),

(4 , "Lenny", 19 ,1),

(5 ,"Wendy",22, 2),

(6 ,"Logan", 22, 1),

(7 ,"Thabo,", 27, 1),

(8 ,"Thandi", 25, 2),

(9 ,"Lucky", 24, 1),

(10 ,"Vince", 20, 1);

CREATE TABLE Library(

id INTEGER NOT NULL PRIMARY KEY,

Name TEXT,

ISBN TEXT ,

Author TEXT,

Category TEXT

);

INSERT INTO Library VALUES(1,"Old man and the sea", "123-AA-32377", "Hemingway, Ernest", "Fiction"),

(2 ,"The nature of the Universe", "123-AA-32378", "Gallant, Roy A", "Science"),

(3 ,"The Great Gatsby" ,"374-DC-23056" ,"F. Scott Fitzgerald", "Novel"),

(4 ,"To Kill A Mockingbird" ,"939-MA-4456", "Harper Lee", "Novel"),

(5, "Hitch Hikers Guide To The Galaxy" ,"001-AA-3902", "M. J. Simpson", "Fiction");

CREATE TABLE StudentBooks(

id INTEGER NOT NULL PRIMARY KEY,

LibraryId INTEGER NOT NULL REFERENCES Library,

StudentId INTEGER NOT NULL REFERENCES Students);

INSERT INTO StudentBooks VALUES

(1 ,1 ,1),

(2 ,3 ,1),

(3 ,4 ,1),

(4 ,4 ,5),

(5 ,4 ,8),

(6 ,5 ,8),

(7 ,3 ,3);