UNIVERSITY EXAMINATIONS

EXAMINATION FOR SEPTEMBER/DECEMBER 2019/2020 DIPLOMA IN COMPUTER SCIENCE/DIPLOMA IN INFORMATION TECHNOLOGY/ DIPLOMA IN BUSINESS INFORMATION TECHNOLOGY

RCS 037/RCS015: INTRODUCTION TO DATABASE/RELATIONAL DATABASE

DATE: 9TH DECEMBER 2019 **TIME: 2 HOURS**

GENERAL INSTRUCTIONS:

Students are NOT permitted to write on the examination paper during examination time.

This is a closed book examination. Text book/Reference books/notes are not permitted.

SPECIAL INSTRUCTIONS:

This examination paper consists Questions in Section A followed by section B.

Answer Question 1 and any Other Two questions.

QUESTIONS in ALL Sections should be answered in answer booklet(s).

1. **PLEASE start the answer to EACH question on a NEW PAGE.**
2. **Keep your phone(s) switched off at the front of the examination room.**
3. **Keep ALL bags and caps at the front of the examination room and DO NOT refer to ANY unauthorized material before or during the course of the examination.**
4. **ALWAYS show your working.**
5. **Marks indicated in parenthesis i.e. ( ) will be awarded for clear and logical answers.**
6. **Write your REGISTRATION No. clearly on the answer booklet(s).**
7. **For the Questions, write the number of the question on the answer booklet(s) in the order you answered them.**
8. **DO NOT use your PHONE as a CALCULATOR.**
9. **YOU are ONLY ALLOWED to leave the exam room 30minutes to the end of the Exam.**
10. **DO NOT write on the QUESTION PAPER. Use the back of your BOOKLET for any calculations or rough work.**

SECTION A (COMPULSORY)

Question One (30marks)

a. Define the following terms **(5marks)**
   i. Database schema
   ii. Relation
   iii. Tuple
   iv. Database
   v. Field

b. The ANSI/SPARC has established a three level architecture for a DBMS. Name the 3 levels. **(3marks)**

c. Explain five advantages of a database management system over the traditional-based system **(5marks)**

d. What is an E-R diagram? Describe four components associated to an E-R diagram **(8marks)**

e. Explain why an E-R diagram is important in the creation of a database management system. **(4marks)**

f. Study the following table below and answer the questions that follows.

Adm. No	Fname	Lname	Course
AD1010122	Meshack	Looni	IT
AD1011034	Racheal	Norari	Business
AD2091288	Jack	masheni	Journalism

   i. Draw an E-R diagram to represent the relational diagram described above **(4marks)**

   ii. What is the appropriate name you would give to your table **(1mark)**

SECTION B (ANSWER ANY TWO QUESTIONS)

Question Two (20marks)

a. What is Normalization? **(2marks)**

b. Give two major reasons for Normalization. **(4marks)**

c. State three different types of anomalies that Normalization tries to resolve. **(5marks)**

d. List and explain the three types of normalization used in DBMS. **(9marks)**

Question Three (20marks)

a. List three relational database management programs that can be used to build database. **(3marks)**

b. Define the purpose of the following as used in the creation of databases.
   i. Primary key **(1mark)**
   ii. Foreign key **(1mark)**
   iii. Null **(1mark)**
   iv. Data-type **(1mark)**
   v. Unique Key **(1mark)**

c. Operators are used to specify conditions in an SQL statement and to serve as conjunctions for multiple conditions in a statement. With the use of examples name and explain any three operators used. **(6marks)**

d. Describe the six components of a database management system. **(6marks)**

Question Four (20marks)

a. Define the following terms as used in database management system
   i. Database **(2marks)**
   ii. Database integrity **(2marks)**
   iii. Concurrency Control **(2marks)**
   iv. Derived attribute **(2marks)**
   v. Cardinality **(2marks)**

b. Describe the role of database management systems (DBMS) in the database approach. Discuss why knowledge of DBMS is important for database administrators.**(6marks)**

c. Define the purpose of the following functions as used in SQL. **(4marks)**
   i. Max ( )
   ii. Min( )
   iii. Count( )
   iv. Lower( )

Question Five (20marks)

a. Describe the six components of a database management system. **(6marks)**

b. Study the following relational model and answer the question that follows.

staffNo	fName	lName	position	sex	DOB	salary	branchNo
SL21	John	White	Manager	M	1-Oct-45	30000	B005
SG37	Ann	Beech	Assistant	F	10-Nov-60	12000	B003
SG14	David	Ford	Supervisor	M	24-Mar-58	18000	B003
SA9	Mary	Howe	Assistant	F	19-Feb-70	9000	B007
SG5	Susan	Brand	Manager	F	3-Jun-40	24000	B003
SL41	Julie	Lee	Assistant	F	13-Jun-65	9000	B005

a. What is the appropriate name you would give to your table **(1mark)**

b. Write a SELECT statement that displays:
   i. The entire table. **(1marks)**
   ii. Extracts the column by the First Name **(2marks)**
   iii. Records that are Distinct. **(2marks)**
   iv. Branch Number=B003 **(2marks)**
   v. Staff Number =SG37 and Date of Birth=10-Nov-60 **(2marks)**
   vi. Top 3 records only. **(1mark)**

c. As per the table above, insert a new record of your own choice and use the appropriate SQL statement to do so. . **(3marks)**