



SCHOOL OF PROFESSIONAL STUDIES

BACHELOR OF BUSINESS INFORMATION TECHNOLOGY/ BACHELOR OF INFORMATION COMMUNICATION TECHNOLOGY

UNIT CODE/NAME: BBIT 121/ BCT 214: DATABASE SYSTEMS

January – April 2018/2019 End Semester Exam

- Time: 2 Hours

Instructions: Answer Question ONE (Compulsory) and any other TWO questions.

QUESTION ONE

Digitech is a business enterprise with four operational departments. Each department has its own file based system that they use to carry out their day to day activities. They have contacted you as a database specialist to manage a project in which they are implementing a database system that will effectively serve the entire enterprise.

- Describe four benefits they are likely to enjoy after implementing the database system? **(4 marks)**
- Advice Digitech on the best database architecture to use in the database development of their database. **(1 marks)**
 - Highlight three reasons for your choice in b(i) above. **(3 marks)**
- The implementation of the database system does not solve all problems associated with storage of information. Highlight four challenges that may be faced in the use of database systems? **(4 marks)**
- The system analysts designing the Digitech database have identified three entities namely: staff, branch and department. Using appropriate attributes and relationships between the entities, design a suitable Entity relationship diagram for the database. **(6 marks)**
- Outline three reasons why the developers may wish to use a View in their database implementation. **(3 marks)**
- Differentiate between a primary key and foreign key **(2 marks)**
- Provide a comparison between the shared and the exclusive locks on how they may be applied to ensure database concurrency. **(4 marks)**
- Being one of those students taking units in database management systems, describe three potential professional opportunities in the sector and their roles. **(3 marks)**

QUESTION TWO

- Describe the five major components of a database management system. **(5 marks)**
- Using illustrations, discuss the following database models. **(3 marks)**
 - Hierarchical model
 - Network model
 - Relational model
- Consider the table structure below.

Items table

ItemCode	ItemName	Quantity	UnitPrice
3081	Sugar	0.5	40.0

3082	Sugar	1.0	80.0
3083	Sugar	2.0	175.0
4081	Bread	0.4	50.0
4082	Bread	1.0	85.0
5081	Milk	0.5	50.0

Write SQL commands to perform the following:

- (i) To create the Items table. **(3 marks)**
- (ii) Select all records in the Items table **(2 marks)**
- (iii) To return the table below where the ItemName is 'Sugar' **(2 marks)**

ItemCode	ItemName	Quantity	UnitPrice
3081	Sugar	0.5	40.0
3082	Sugar	1.0	80.0
3083	Sugar	2.0	175.0

QUESTION THREE

- a) Discuss any five database application areas clearly stating how the database system will be used. **(5 marks)**
- c) Briefly explain the three database architectures that may be used in database design? **(3 marks)**
- d) Describe any three data types in MySQL providing an example in each data type. **(3 marks)**
- e) Identify any four system failures that necessitate the need for database recovery. **(4 marks)**

QUESTION FOUR

- a) Define the following terms: **(3 marks)**
 - i) Database
 - ii) Database management system
 - iii) Transaction
- b) The elements of a table form its structure. Name and explain any three elements and use an example to show the particular elements explained. **(3 marks)**
- c) Discuss the seven major stages you are likely to follow in the development process of the database. **(7 marks)**
- d) Describe four desirable properties of a transaction. **(2 marks)**

QUESTION FIVE

- a) Structured Query Language can be broadly classified into three classes. Explain each of the below categories.
 - (i) Data Definition Language (DDL) **(1 mark)**
 - (ii) Data Manipulation Language (DML) **(1 mark)**
- b) i) What is normalization in database development? **(2 marks)**
 - ii) Normalization is majorly applied to solve the serious problem of using relations known as the problem of update anomalies. Identify and briefly explain the three update anomalies. **(3 marks)**
- c) Differentiate between the following terms: **(8 marks)**
 - i) Super key and a candidate key
 - ii) Single user and a Multi-user system
 - iii) Database application and a database system
 - iv) Single-Valued and Multi-Valued Attributes