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UNIVERSITY EXAMINATIONS
2022/2023 ACADEMIC YEAR

SPECIAL/SUPPLEMENTARY EXAMINATIONS
YEAR ONE SEMESTER TWO EXAMINATIONS

FOR THE DIPLOMA IN
(INFORMATION TECHNOLOGY)

COURSE CODE : DIT 059

COURSE TITLE : DATABASE SYSTEMS

DATE: 15/08/2023

TIME: 8.00 A.M- 10.00 A.M

INSTRUCTIONS TO CANDIDATES

ANSWER QUESTIONS ONE AND ANY OTHER TWO

QUESTION ONE (24 MARKS) - COMPULSORY

- a. Define the following terms as use in database systems (4Marks)
- i. Database
 - ii. Database management systems
- b. Differentiate between traditional file processing and database management systems (8Marks)
- c. *Relationships* are the glue that holds the tables together state and explain three types of relationships found among the tables in a database (6Marks)
- d. List any four Structured Query Language (SQL) statements and state their meaning (4Marks)

QUESTION TWO (18MARKS)

- a. Define the term normalization as used in database (2Marks)
- b. A software contract and consultancy firm maintains details of all the various projects in which its employees are currently involved. These details comprise:
- Employee Number
 - Employee Name
 - Date of Birth
 - Department Code
 - Department Name
 - Project Code
 - Project Description
 - Project Supervisor

Assume the following:

- Each employee number is unique.
- Each department has a single department code.
- Each project has a single code and supervisor.
- Each employee may work on one or more projects.
- Employee names need not necessarily be unique.

Project Code, Project Description and Project Supervisor are repeating fields.

Normalize this data to Third Normal Form. (10Marks)

- c. State and explain three types of data anomalies in database (6Marks)

QUESTION THREE (18MARKS)

- a. write an SQL statement that creates the table below (5Marks)

Student table

REG NO	FNAME	LNAME	COURSE	DEPARTMENT

- b. write an SQL statement that inserts the following values in table in b.i above
**REG NO= 'dit/0001/2020', FNAME= 'joseph', LNAME='Israel',
 COURSE='diploma in it', DEPARTMENT = 'IT'. (5Marks)**
- c. write an SQL statement that selects students **REG NO, FNAME** and **DEPARTMENT (3Marks)**
- d. write an SQL statement that updates **FNAME** of the value inserted in student table in b.ii above to Samuel (5Marks)

QUESTION FOUR [18MARKS]

Describe the following database models

- a. Hierarchical Model (4Marks)
- b. Network Model (4Marks)
- c. Entity-relationship Model (5Marks)
- d. Relational Model (5Marks)

QUESTION FIVE 18 MARKS

- a. Define the term a transaction as used in database systems (2Marks)
- b. State and explain the **four** properties of a transaction (8Marks)
- c. Using a diagram describe **five** states of a transaction (5Marks)
- d.
- i. define the term deadlock as use in a transaction (1Mark)
- ii. state and explain any two concurrency control mechanisms (2Marks)