ZIMBABWE EZEKIEL GUTI UNIVERSITY

FACULTY OF SCIENCE ,TECHNOLOGY, AGRICULTURE & FOOD SYSTEMS DEVELOPMENT.

DEPARTMENT OF INFORMATION SYSTEMS

EXAMINATION PAPER

COURSE CODE	:	MIS 106
COURSE TITLE	:	Database Systems
SPECIAL REQUIREMENTS	:	None
DURATION	:	3 Hours
LEVEL	:	1.2
DATE	:	11 APR 2023

INSTRUCTIONS TO CANDIDATES:

1. Answer any 4 Questions from the whole paper.
2. The total Marks for the examination is 100.
3. The marks allocation for each question are indicated in square brackets [] .

Question 1

a. Define the following terms:
   i) Domain. **[2]**
   ii) Derived attribute. **[2]**
   iii) Weak entity **[2]**
   iv) Composite attribute. **[2]**
   v) Multivalued attribute. **[2]**

b. Draw a state transition diagram illustrating the states for transaction execution. **[5]**

c. Briefly describe the diagram you have drawn above. **[6]**

d. Differentiate between logical data independence and physical data independence. **[4]**

[TOTAL 25]

Question 2

a. With appropriate examples discuss the ACIDS properties of a transaction. [15]

b. Write SQL statements to create a table named STUDENT with the following attributes:

   StudNum(primary key), Course(foreign key), Level and Sex. [6]

c. What are the advantages of concurrent executions of transactions [4]

[TOTAL 25]

Question 3

a) What is an ER diagram? **[2]**

b) Suppose you are given the following requirements for a simple database for the Northern Zone Hockey League(NZHL):

- The NZHL has many teams,
- Each team has a name, a city, a coach, a captain, and a set of players,
- Each player belongs to only one team,
- Each player has a name, a position, a skill level, and a set of injury records,
- A team captain is also a player,
- A game is played between two teams (referred to as host_team and guest_team) and has a date and a score (such as 2 to1).

Construct an ER diagram for the NZHL database. **[10]**

c) Discuss the acid properties of a database. **[10]**

d) Give three different application areas of databases **[3]**

[TOTAL 25]

Question 4

a. Give a brief discussion of the advantages of DBMS **[15]**

b. Discuss each of the following concepts in the context of the relational data model:

a. Tuple. **[2]**
b. View. **[2]**
c. Cardinality. **[2]**
d. Relation. **[2]**
e. Degree. **[2]**

[TOTAL 25]

Question 5

a. Explain a deadlock. **[4]**
b. Describe 2 ways in which the deadlock can be prevented. **[6]**
c. Use two transactions T1 and T2 to demonstrate deadlock. **[4]**
d. Use diagrasms to represent the following ERD elements
    i) Entity [2]
    ii) Weak entity [2]
    iii) Multivalued attribute [2]
    iv) Weak relationship [2]
e. Explain is a transaction [3]

[TOTAL 25]

End of Paper

0/5 pm