



**ZIMBABWE EZEKIEL GUTI UNIVERSITY**

**FACULTY OF HEALTH, SCIENCE AND TECHNOLOGY**

**DEPARTMENT OF DIGITAL TECHNOLOGY**

**EXAMINATION PAPER**

**COURSE CODE** : MIS 106  
**COURSE TITLE** : Database Systems  
**SPECIAL REQUIREMENTS** : None  
**DURATION** : 3 Hours  
**LEVEL** : 1.2  
**DATE** : 07 JUL 2022

**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) Name the stages in database design and describe each. [10]
- b) Define a Database [3]
- c) Differentiate between metadata and data [2]
- d) Discuss each of the following concepts in the context of the relational data model:
- a. Relationship. [2]
  - b. Entity. [2]
  - c. Attribute. [2]
  - d. Domain. [2]
  - e. Entity type. [2]

[TOTAL 25]

### Question 2

- a) Discuss the disadvantages of the traditional file systems as compared to database systems.[20]
- b) Differentiate between data and information [4]
- c) What is a key in databases[1]

[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:
- f. Tuple. [2]
  - g. View. [2]
  - h. Cardinality. [2]
  - i. Relation. [2]
  - j. 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 diagrams to represent the following ERD elements
- i) Entity [2]
  - ii) Weak entity [2]
  - iii) Multivalued attribute [2]
  - iv) Weak relationship [2]
- e. Explain a transaction [3]

[TOTAL 25]

**End of Paper**

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