



ZIMBABWE EZEKIEL GUTI UNIVERSITY

FACULTY OF, SCIENCE, TECHNOLOGY, AGRIC AND FOOD SYSTEMS
DEVELOPMENT

DEPARTMENT OF DIGITAL TECHNOLOGY AND INFORMATION SYSTEMS

EXAMINATION PAPER

COURSE CODE : **BIS121**
COURSE TITLE : **Database Systems**
SPECIAL REQUIREMENTS : **None**
DURATION : **3 Hours**
LEVEL : **1.2**
DATE :

14 JUN 2024

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 to 1).
- 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 what is meant by a transaction [3]

[TOTAL 25]

End of Paper

0/10 (am)