

# ZIMBABWE EZEKIEL GUTI UNIVERSITY



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## FACULTY OF SCIENCE, TECHNOLOGY, AGRICULTURE AND FOOD SYSTEMS DEVELOPMENT

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### DEPARTMENT OF INFORMATION SYSTEMS

#### EXAMINATION PAPER

COURSE CODE:	DIS125
COURSE TITLE:	DATABASE SYSTEMS
SPECIAL REQUIREMENTS:	NONE
LEVEL:	1.1 and 1.2
EXAM DURATION:	2 hours
DATE:	2025

28 NOV 2025

#### INSTRUCTIONS TO CANDIDATES:

1. Answer **ALL** questions from Section A and any **THREE(3)** Questions from Section B.
2. Start each question on a new page

## SECTION A

### Question 1

- a. Define the following types of attributes and give an example for each:
- i. Single-valued attribute.
  - ii. Composite attribute.
  - iii. Multi-valued attribute.
  - iv. Derived attribute. [8]
- b. Distinguish between primary key and candidate key. [2]
- c. Differentiate between the following terms as they are used in databases
- i. Domain constraint and Entity integrity
  - ii. Schema and instance
  - iii. Data dependence and data independence
- [9]

### Question 2

- a. Describe THREE limitations of a traditional file system and explain how a Database Management System (DBMS) may overcome these limitations. [9]
- b. Describe duties of a database administrator [6]

## SECTION B

### Question 3

- a. State and explain 6 advantages of using a database in an organisation [12]
- b. Distinguish between logical data independence and physical data independence. [5]

- c. List three limitations of database systems for data management.

[3]

#### Question 4

- a. Describe five responsibilities of a database administrator in a centralized database system. [10]
- b. Describe the two principal integrity rules for the relational model [6]
- c. Give any two possible benefits of views in databases. [4]

#### Question 5

- a. State and explain advantages and disadvantages of the following database models
- i. Hierarchical
  - ii. Network
  - iii. Relational [9]
- b. Most DBMS provide Authorisation Services. Explain what these are and how they might be implemented. [5]
- c. Give **THREE** reasons why an organisation might choose not to use a DBMS. [6]

#### Question 6

- a. Describe the key "ACID" properties of transactions that ensure consistency and reliability in database systems. [10]
- b. One purchasing section of a supermarket deals with fruit, vegetables and flower purchases. The department employs a number of agents in different locations. Each of these agents has contracts with a number of farmers who will supply the produce as required. The supermarket database contains the

following relations: - Purchasing-Dept(Produce-type, Address, Email, Phone)  
Agent(Agent-ref-no, Name, Address, Email, Phone, Produce-type)  
Farmer(Farmer-Ref-No. Name, Address, Email, Phone, Main-produce,  
Secondary-produce, Agent-ref-no)

Draw an Entity-Relationship Diagram (ERD) to show the relationship between these three entities. [10]

**Question 7**

- a. Differentiate between DDL and DML giving one example for each. [5]
- b. Explain the stages of the database application life cycle [15]

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