NATIONAL UNIVERSITY OF SCIENCE AND TECHNOLOGY
FACULTY OF APPLIED SCIENCES
DEPARTMENT OF COMPUTER SCIENCE

DATA CONCEPTS AND DATA PROCESSING
SCS 1200

Examination Paper
MARCH 2025

This examination paper consists of 4 pages

Time Allowed:	**3 hours**
Total Marks:	**100**
Examiner's Name:	**Mr. M. Ruzive**
External Examiner:	

INSTRUCTIONS

1. Answer any four (4) questions

2. Each question carries 25 marks

MARK ALLOCATION

QUESTION	MARKS
1.	25
2.	25
3.	25
4.	25
5.	25
TOTAL FOR ANY FOUR QUESTION	**100**

QUESTION ONE

a. Discuss any five (5) issues addressed by the introduction of database management systems. (10)

b. State any five (5) groups of database users, for each user stated, highlight their core duties and state whether they are an end-user or a database worker. (15)

QUESTION TWO

a. With the aid of a diagram, explain the three-schema database architecture, clearly outlining how the architecture achieves data abstraction and data independence. (12)

b. State any four (4) elements described by a conceptual schema. (4)

c. Compare a Database, Data Warehouse and Data Lake in terms of size, data structure and type of data processing. (9)

QUESTION THREE

a. Using a diagram, explain the basic components of a Database system. (7)

b. How are database management systems classified? (10)

c. What are the ACID properties and how are they important in the processing of database transactions? (8)

QUESTION FOUR

a. A company's database stores sensitive customer information, including credit card numbers and addresses. The database is accessible through a web application. Discuss the scope of database security in this scenario,

identify potential threats, and outline ways to counter these threats.

(15)

b. Consider a database with two tables: **employees** and **departments**. Two database users, **hr_manager** and **department_head**, need to access these tables. Write SQL commands to implementing Access Control on the database tables as specified by the rules given below:

   i.   Rule 1: hr_manager has SELECT, INSERT, and UPDATE privileges on the employees table.   (1)

   ii. Rule 2: department_head has SELECT and INSERT privileges on the departments table.   (1)

   iii. Rule 3: hr_manager should no longer have any privileges on the departments table.   (1)

   iv. Rule 4: department_head should no longer have any privileges on the employees table.   (1)

   v.   Rule 5: remove both users from the database.   (1)

c. What do the following SQL language category acronyms stand for? Provide one(1) example command found under each one of them.

   i.   DDL   (1)
   ii. DML   (1)
   iii. TCL   (1)
   iv. DCL   (1)
   v.   DQL   (1)

QUESTION FIVE

a. Draw and briefly explain any five (5) Entity Relationship Diagram symbols.

(10)

b. Give a detailed account of what an Entity Relationship Diagram (ERD) is and how it is constructed during database design.   (5)

d. What are the following keys used for in a Relational database?

    i.   Unique Key   (2)

    ii.   Candidate key   (2)

    iii.   Foreign Key   (2)

    iv.   Primary Key   (2)

    v.   Composite Key   (2)

END OF QUESTION PAPER