

NATIONAL UNIVERSITY OF SCIENCE AND TECHNOLOGY
FACULTY OF APPLIED SCIENCE
COMPUTER SCIENCE DEPARTMENT
DECEMBER 2002 EXAMINATIONS

SUBJECT: DATABASE CONCEPTS AND DATA PROCESSING
CODE: SCS1202

Instructions to candidate:

1. This question paper consists of seven (7) questions, answer any five (5).

3 HOURS

QUESTION ONE

Explain the evolution in Database Management Systems, citing advantages and disadvantages of the different models. [20]

QUESTION TWO

a) What are the main functions of a Database Management System? [12]

b) Define the following terms:

- (i) Concurrent access
- (ii) Data independence
- (iii) Integrity
- (iv) Persistent data

[8]

QUESTION THREE

a) Describe the 3 levels of abstraction in a database. [10]

b) State the relative advantages and disadvantages of an index structure when compared with a heap structure. [10]

QUESTION FOUR

- a) What are the properties of Relations? [8]
- b) Describe the Constraints in Relational Database Management System. [12]

QUESTION FIVE

Give examples of SQL queries where you would make use of the following clauses:

- I] EXISTS
II] IN
III] GROUP BY
IV] ANY

[20]

QUESTION SIX

A database of employees of a certain company consists of the following fields:

employee number, first name, second name, age, department, salary and date hired.

Write SQL statements to perform the following operations on the employees' database.

- a) Retrieve employee number and names of employees in management department.
- b) Retrieve employee number and names of employees hired before 18 April 1980.
- c) Retrieve the number of employees with salaries above \$50 000 and whose age is below 40 years.
- d) Increment salary for employee whose number is 131, by 50%.

- e) Add a record for new employee in marketing department. The employee number is 1003, first name is John, second name is Matwe, date hired is today, age is 30 and salary is \$100 000.

[20]

QUESTION SEVEN

- a) Define a relational view and state its main advantage.
- b) Write a query expression to define a view.

[12]

[8]

END OF QUESTION PAPER

GOOD LUCK!