

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

**MAY EXAMINATIONS 2011**

**SUBJECT: DATABASE CONCEPTS AND DATA PROCESSING**  
**CODE: SCS1200**

**INSTRUCTION TO CANDIDATES**

**ANSWER ALL QUESTIONS IN SECTION A**

**ANSWER ANY THREE QUESTIONS IN SECTION B**  
**EACH QUESTION CARRIES 25 MARKS**

**Time: 3 hours**

**SECTION A**

**QUESTION ONE**

- a) What are the conditions for a table to be in 2NF? [3]
- b) What is the objective of normalization? [9]
- c) Normalize the following table to third normal form (3NF). [13]

Pupil ID	Name	Grade	Class	Class Capacity	Teacher
N0010G	Dube Lisa	3	Green	33	S. S Dube

## **SECTION B**

### **QUESTION TWO**

a) A University has seven faculties, each faculty is headed by a Dean and is made up of seven departments. Each department is headed by a chairperson and the chairperson supervises several lecturers. The lecturers teach courses that are taken by several students in order for them to complete their degree programs and graduate. The university is headed by a Vice Chancellor and all Faculty Deans report to him.

- a) Draw an E\_R diagram to represent the above situation. [15]
- b) What are the duties of a Database Administrator? [5]
- c) What are the advantages of using a database? [5]

### **QUESTION THREE**

- a) List any five ways used to classify database management systems. [5]
- b) Name and explain any five types of database system end users. [10]
- c) Compare the Entity relationship model with the hierarchical data model. [10]

#### QUESTION FOUR

a) What do we use a form, report, query and a table for in a Microsoft Access database? [8]

b) Define the following terms

- i. Foreign key
- ii. Domain Integrity
- iii. Primary key
- iv. Entity integrity
- v. Degree of a relationship. [5]

c) Give a detailed explanation of the four elements of data processing. [12]

#### QUESTION FIVE

a) Use figure 1 and figure 2 to answer the questions

##### Employees

ID	INITIAL	SURNAME	DEPT
1005	D F	Mukura	Accounts
1006	Z H	Sibanda	Sales
1010	S k	Nyathi	Purchases

**Figure 1**

## Managers

ID	INITIAL	SURNAME	DEPT
M1990	T P	Dube	Stores
M1220	L	Peswa	Public Relations
M1342	S	Tsoro	Bursar
M1345	P	Mhiha	Salaries

**Figure 2**

- i. Find employees DIFFERENCE managers. [2]
- ii. PROJECT surname in Employees. [3]
- iii. Find the PRODUCT of Managers and Employees. [3]

b) Answer the following questions using the details in figure 3

ID Number	Surname	First name	Age	Address	City
011	Da Gama	Sue	22	7 Fort Street	Mutare
022	Elliot	Mick	13	12197 Delloit Ave	Gweru
033	Bucket	Richard	19	17 MacNamara Gardens	Mutare
04	Zidane	Meyer	6	88 Kerr Street Khumalo	Bulawayo
05	Berger	Lisa	14	4 Jason Moyo Street	Gweru

**Figure 3**

- i. Write an SQL statement to create the table. [3]
- ii. Write an SQL statement to list all persons with surnames with "B" pattern at the beginning. [4]
- iii. What is the primary key of the table? [2]
- iv. Write an SQL statement that lists all persons from the city of Gweru. [4]
- v. Write an SQL statement that gives the average age for all the people recorded in the above table [4]

### **QUESTION SIX**

- a) With the aid of a diagram explain how the ANSI-SPARC architecture achieves program-data independence in a database system [8]
- b) i) What would be the disadvantages of keeping student records in a file? [6]
- ii) What would be the advantages of keeping students' records in a database? [6]
- b) List any five functions of a database management system? [5]

**END OF QUESTION PAPER**

