

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

SUBJECT: DATABASE CONCEPTS AND DATA SYSTEMS
CODE: SCS 1200

Instructions to candidate:

1. Answer any four questions in Section A and the question in Section B.
2. Each question carries 20 marks

3 HOURS

SECTION A

QUESTION ONE

- a) Define what a DBMS is and explain how it differs from a file processing system. [8]
- b) Briefly explain the disadvantages of a typical file processing system. [12]

QUESTION TWO

- a) What is the role of each of the following in a Database Management System?
 - (i) Database administrator
 - (ii) File Manager
 - (iii) Query Processor
 - (iv) DDL Compiler [8]
- b) List and briefly explain the functions of a Database Manager. [12]

QUESTION THREE

Consider the registrar's office which enrolls and keeps records of all students at the university

- a) Identify the entity sets that may exist. [2]
- b) For each list the attributes that may exist. [2]

- c) With the help of an entity – relationship diagram, illustrate the mapping cardinalities that may exist.
[6]
- d) Based on the relational model, design tables for those entities and show relationships if any exist. [10]

QUESTION FOUR

- a) Define the following terms
- i) Aggregation
 - ii) Relationship
 - iii) Primary key [6]
- b) Using a banking enterprise as an example, illustrate the differences between the 3 levels of data abstraction. [10]
- c) Explain the difference between generalization and specialization. [4]

QUESTION FIVE

- a) Explain the difference between a weak and strong entity set. [2]
- b) Briefly describe data independence and explain how it differs from data abstraction. [8]
- c) List and briefly describe the different types of database users and how each differs from the other. [10]

SECTION B

QUESTION SIX

Consider the following table scheme of a relational database :

employee (Id_no, Name , Salary , Dept)

personal (Id_no , Age , Highest_Degree)

department (Dept , Manager , Location)

Give expressions in SQL for each query below:

- a) Get the Id_no and name of all employees in the toys department. [5]
- b) Get the Id_no and name of all employees in the toys department who earn between \$ 20 000 and \$ 40 000. [5]
- c) Get the Id_no and name of all employees whose highest degree is a BSc and who earn \$ 20 000 and \$ 40 000. [5]
- d) Retrieve the Id_no and name of all employees whose manager has Id_no 4444 and who earn between \$ 20 000 and \$ 40 000. [5]

END OF QUESTION PAPER

GOOD LUCK!