Department of Technical Education and Training

NVQ Level 05 Written Examination – April 2011 (Semester I)

National Diploma in Information & Communication Technology

Database Systems I	*5S1 NVQ 001*	**Three hours**

Instructions : Answer five (05) questions.

1. Briefly explain the following terms
   i. Three-Schema architecture (06 marks)
   ii. Composite Key and Foreign Key (06 marks)
   iii. DDL & DML (08 marks)

2. i. Why use a DBMS? (10 marks)
   ii. What are the Characteristics of Modern DBMS? (10 marks)

3. Draw a diagram showing each of the following relationships on an ERD:
   (a) The customer places many orders. Each order is received from one customer.
   (b) The customer order may contain many requests for products. Each product will feature on many customer orders.
   (c) Each customer has a single customer representative who is responsible for them. Each customer representative is responsible for many customers.

   (20 marks)

4. Create an ERD model, using the following requirements.
   - An INVOICE is written by a SALESREP. Each sales representative can write many invoices, but each invoice is written by a single sales representative.
   - The INVOICE is written for a single CUSTOMER. However, each customer can have many invoices.
   - An INVOICE may include many detail lines (LINE) which describe the products bought by the customer.
   - The product information is stored in a PRODUCT entity.
   - The product's vendor information is found in a VENDOR entity.

   (20 marks)

5. Normalize the following table to 1NF, 2NF and 3NF.

Student#	AdvID	AdvName	AdvRoom	Class#
123	123A	James	555	102-8
123	123A	James	555	104-9
124	123B	Smith	467	209-0
124	123B	Smith	467	102-8

(20 marks)

6. Consider the following schema:

Suppliers (*sid:* integer, *sname:* string, *address:* string)

Parts (*pid:* integer, *pname:* string, *color:* string)

Catalog (*sid:* integer, *pid:* integer, *cost:* real)

The key fields are underlined, and the domain of each field is listed after the field name. Therefore *sid* is the key for Suppliers, *pid* is the key for Parts, and *sid* and *pid* together form the key for Catalog. The Catalog relation lists the prices charged for parts by Suppliers.

Write SQL statements for the following queries

i. Find the *name*s of suppliers who supply some "red" parts. (08 marks)

ii. Find the *sid*s of suppliers who supply some "red" parts or they are at "221, Packer Street".

(12 marks)

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