Department of Technical Education and Training

NVQ Level 05 Written Examination – December 2019 (Semester I)

National Diploma in Information & Communication Technology

Database Systems I	**5S1NVQ001**	**Three Hours**

Instructions: **Answer any four (04) questions.**

(This paper consists of 02 pages.)

1. (i) Define the computer Database. (04 Marks)

   (ii) Briefly explain the following terms related to the databases:

   (a) Flat File system

   (b) Mini World

   (c) Data Dictionary (09 Marks)

   (iii) "DBMS (Database Management System) acts as an interface between the user and the database."

   Explain this statement by giving the structural components of the DBMS with their related functions in interacting with the user. (12 Marks)

2. (i) Write down any three responsibilities of a database administrator. (06 Marks)

   (ii) State the difference between security and integrity. (07 Marks)

   (iii) Explain the following constrains used in Relational data model giving examples:

   (a) Domain constrains

   (b) Key constrains

   (c) Referential integrity constrains (12 Marks)

3. (i) Explain the two levels of data independence in brief. (07 Marks)

   (ii) A vocational university consists of a number of departments. System keeps the details of departments like Department No, Department name and start date. Each department offers several technical courses. A number of modules make up each technical course.

   Students enroll in a particular course and take modules towards the completion of that course. Each module is taught by a lecturer from the appropriate department, and each lecturer tutors a group of students. unique Student id, Student Name, Gender. Date of Birth details are stored in the system.

   (a) Draw the Entity Relationship Diagram by identifying entities, relationships and attributes for the above case study. (18 Marks)

4. (i) Briefly explain the following terms:

(a) Cardinality ratio

(b) Candidate Key (05 Marks)

(ii) Consider the following table called "**Projects**" and normalize up to 3NF showing all necessary steps:

Project

Dept_No	DepName	EmployeeID	Ename	Adders	Project	Dead_line
D1	Math	E001	Amali	Galle	Y	09/03/19
		E002	Kamal	Mardana	X	08/03/19
		E010	Pubudu	Badulla	X	08/03/19
D2	Zoology	E002	Kamal	Mardana	P	10/03/19
		E003	Chaturika	Kandy	Q	08/03/19

(iii) In what normal form is this Project table? (02 Marks)

(iv) Normalize Project table into 1NF, 2NF and 3NF relations. (18 Marks)

5. (i) What is DML? Explain in brief by giving two DML statements used in SQL. (04 Marks)

(ii) Write SQL statements for the following table structures for Item and Sales.

Item

Item_code	Description	Price

Sales

Invoice_No	Item_code	Qty_sold

(a) Write SQL statements to create the above "Item" and "Sales" tables with their relationship using suitable data types. (06 Marks)

(b) Add a new field as "Date_Sold" into the existing "Sales" table. (03 Marks)

(c) Add a new record into Item table with the following details 'Item_code: T001', 'Description: Table Fan', Price: 4500. (03 Marks)

(d) List all the items with price between Rs. 2000 and Rs. 5000 (03 Marks)

(e) Increase the price of all the items by 5%. (03 Marks)

(f) Delete all the records in "Item" table starting the item_code with character 'F'. (03 Marks)

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