Department of Technical Education and Training 0000000020

NVQ LEVEL 05 WRITTEN EXAMINATION – MARCH 2011
(REPEAT EXAMINATION)

National Diploma in Information & Communication Technology – NVQ Level 5

Database Systems	**5 NV 001**	**Three Hours**

Instructions: Answer five (05) questions.

This paper contains 02 pages.

1. Write down short notes
   i. Attributes
   ii. Entity
   iii. Relationship
   iv. Weak Entity Set
   v. Aggregation (20 Marks)

2. i. What is a DBMS?

   ii. Why use a DBMS? (20 Marks)

3. UPS prides itself on having up-to-date information on the processing and current location of each shipped item. To do this, UPS relies on a company-wide information system. Shipped items are the heart of the UPS product tracking information system. Shipped items can be characterized by item number (unique), weight, dimensions, insurance amount, destination, and final delivery date. Shipped items are received into the UPS system at a single retail center. Retail centers are characterized by their type, uniqueID, and address. Shipped items make their way to their destination via one or more standard UPS transportation events (i.e., flights, truck deliveries). These transportation events are characterized by a unique scheduleNumber, a type (e.g, flight, truck), and a deliveryRoute.

   Create an Entity Relationship diagram that captures this information about the UPS system. Be certain to indicate identifiers and cardinality constraints. (20 Marks)

4. Consider database schema

employee(employee-name, street, city)

works(employee-name, company-name, salary)

company(company-name, city)

manages(employee-name, managername)

i. Write SQL statements to : find all employees who live in the same cities as the companies for which they work (10 Marks)

ii. Find all employees in the database who live on the same city and streets as their manager. (10 Marks)

5. Consider the following relations:

Student(*snum:* integer, *sname:* string, *major:* string, *level:* string, *age:* integer)

Class(*name:* string, *meets at:* string, *room:* string, *fid:* integer)

Enrolled(*snum:* integer, *cname:* string)

Faculty(*fid*: integer, *fname:* string, *deptid:* integer)

The meaning of these relations is straightforward; for example, Enrolled has one record per student-class pair such that the student is enrolled in the class.

Write the following queries in SQL. No duplicates should be printed in any of the answers.

(a) Find the names of all Juniors (level = JR) who are enrolled in a class taught by 'I.Teach'.

(b) Find the names of students not enrolled in any class. (20 Marks)

6. Normalize the following table to 3NF

PROJECT (PROJ_NUM, PROJ_NAME, EMP_NUM, EMP_NAME, JOB_CLASS, CHG_HOUR, PROJ_NUM, EMP_NUM, HOURS)

- The company manages many projects.
- Each project requires the services of many employees.
- An employee may be assigned to several different projects.
- Some employees are not assigned to a project and perform duties not specifically related to a project. Some employees are part of a labour pool, to be shared by all project teams.
- Each employee has a (single) primary job classification. This job classification determines the hourly billing rate.
- Many employees can have the same job classification (20 Marks)