THE OPEN UNIVERSITY OF SRI LANKA
DEPARTMENT OF ELECTRICAL AND COMPUTER ENGINEERING
DIPLOMA IN TECHNOLOGY - LEVEL 4

ECD 2214 INFORMATION PROCESSING
FINAL EXAMINATION 2005
DURATION : THREE HOURS

034

Date: 31st March 2006 **Time: 9.30 – 12.30**

This examination paper contains 6 questions. The question in **SECTION A** is **compulsory**.

Answer the question in **SECTION A** (40 marks) and any ***three*** questions in **SECTION B** (20 marks each).

SECTION A

Answer all parts of the question in this section using the Scenario given below. The question in this section carries 40 marks.

Scenario:

A car manufacturer produces many models of cars. Each car is built using different spare parts depending on the model. Many different suppliers supply different parts. To handle an out of stock situation more than one supplier may supply one part.

A free service will be provided for all cars during the 1st 100,000 miles. Further, several *after-sales-agents* will attend to sold cars during that warranty service period. To better the customer relationship and trust, each *after-sales-agent* would be handling a set of customers (and would be replaced by another only if he/she leaves the company).

Ensure that you ignore all unnecessary details when answering the questions given below.

1. (a). Draw a complete **0th level** ER diagram with attributes and relationships to represent the above system.

(b). Normalise the entities up to the 3NF. Ensure all relationships and relationship cardinalities are clearly identified.

Note: If you are making any assumptions, please clearly state them at the beginning of your answer.

SECTION B

Answer any three questions in this section. Each question in this section carries 20 marks.

2. Refer the given set of tables and answer the questions given thereafter.

EMPLOYEE

Emp_No	*Name*	*Skill*	*Pay_Rate*
123456	Ron	waiter	7.50
123457	Jon	bartender	8.79
123458	Don	busboy	4.70
123459	Pam	hostess	4.90
123460	Pat	bellboy	4.70
123461	Ian	Maitre d'	9.00
123471	Pierre	chef	14.00
123472	Julie	chef	14.50

POSITION

Position_No	*Skill*
321	Waiter
322	Bartender
323	Busboy
324	Hostess
325	Maitre d'
326	Waiter
350	Chef
351	Chef

DUTY_ALLOCATION

Position_No	*Empl_No*	*Day*	*Shift*
321	123456	19860419	1
322	123457	19860418	2
323	123458	19860418	1
321	123461	19860420	2
321	123461	19860419	2
350	123471	19860418	1
323	123458	19860420	3
351	123471	19860419	1

a) Write SQL code to create the POSITION table.

b) Express each of the following queries in SQL code:

i) To get the DUTY_ALLOCATION details for Empl_No 123461 for the month of April 1986.

ii) To get employees whose rates of pay is more than or equal to the rate of pay of employ Pierre

iii) To find the names of employees who are assigned to all positions that require a chef's skills.

iv) To find the names and the rates of pay of all employees who are not allocated a duty.

3. a). Illustrate the Life Cycle model of software and briefly mention the main functions of each phase.

b) Explain what is **control redundancy** and under what circumstances such is practised.

4. (i). Briefly explain the following terms in terms of Databases:
   a) Security
   b) Recovery
   c) Deadlock
   d) Integrity

   (ii). Describe the function of each of the following:
   a) Data dictionary
   b) Report generator
   c) Forms editor

5. Use the relationships given below to produce examples of the following **RELATIONAL ALGEBRAIC** operations

CUSTOMER	**ITEM**
Customer Number (unique)	Item Number (unique)
Shipping Address	Manufacturing Plants
Balance	Quantity on hand at each plant
Credit Limit	Stock reorder level for each plant
Discount	Item Description

ORDER	**DETAIL LINES**
Order Number (unique)	Item Number (unique)
Customer Number	Ordered Quantity
Shipping Address	
Date of Order	

Write the relations and show the results in a tabular form for

a). A "SELECT" operation

b). A "PROJECT" operation

c). A "JOIN" operation

d). A "PRODUCT" operation

6. a). Briefly explain how data is organised in
   (i). Hierarchical Databases.
   (ii). Network Databases
   (iii). Relational Databases

   b). What are the advantages that we can obtain by using NORMALISATION?

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