THE OPEN UNIVERSITY OF SRI LANKA
DEPARTMENT OF MATHEMATICS AND COMPUTER SCIENCE
B.Sc DEGREE PROGRAMME: LEVEL 04
NO BOOK TEST 2 -2012/2013
CPU2241 – DATABASE MANAGEMENT SYSTEMS

DURATION: ONE AND HALF HOURS

| Date: 27/03/2013 | Time: 4.00 pm – 5.30 pm |
|---|---|

Answer ALL 03 questions

## QUESTION 01

1.1) Define the following terms. Give an example for each by using correct symbols.
   a. Simple attribute
   b. Multivalued attribute
   c. Composite attribute

1.2) The structure of a certain company is as follows.

- The company has a set of departments. The attributes of each of these departments are department number (unique), budget and manager's employee number (unique).
- Each department has a set of employees, a set of projects and a set of offices. The attributes of each are as follows:

  **Employee**: employee number (unique), current project number, office number and phone number

  **Project**: project number (unique), budget

  **Office**: office number (unique), area

- Each employee has a job history (the attribute is job title) for each job. Each employee also has a salary history (the attributes are date and salary).
- Each office has a set of phones. The attribute is phone number.

Draw an ER diagram representing the criteria given above.


TURN OVER FOR QUESTIONS 02 & 03.

**QUESTION 02**

2.1) Write in short, why relations should be normalized.
What are the four (04) types of normal forms?

2.2) State the rules that are necessary to have a relation in the above normal forms mentioned in
2.1

2.3) In what Normal Form, the following relational schema is in? Give reasons.

R (A, B, C, D, E, F, G)

You are given the following functional dependencies.

A, B ⟶ C
A, B ⟶ D
A, B ⟶ E
C ⟶ D
D ⟶ G
E ⟶ A

2.4) What will happen if you add another functional dependency A ⟶ D?


**QUESTION 03**

The following relational database schema is designed for an engineering firm that undertakes civil engineering projects. The database keeps track of employees, departments of the firm and the projects undertaken by it.

Employee (fname, lname, **nid**, bdate, address, sex, salary, super_name, dno)
Department (dname, **dnumber**, manager_id)
Project (pname, **pnumber**, dnum)
Works_on (**enid, pno**, hours)
Dependent (**enid, dependent name**, dependent _sex, dependent_bdate, relationship)

Write down SQL statements to perform the following tasks.

3.1) To create a database called FirstSql_db.

3.2) To construct tables for the above relations.

3.3) To retrieve the salary of all employees whose department no is greater than 5.

3.4) To retrieve employees who are doing projects with Roshan.


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