THE OPEN UNIVERSITY OF SRI LANKA
B.Sc DEGREE PROGRAMME: LEVEL 05
FINAL EXAMINATION -2015/2016
CSU3278: DATABASE MANAGEMENT SYSTEMS

DURATION: **THREE HOURS (3 HOURS)**

Date: 05th January, 2017 **Time: 9.30 a.m – 12.30 p.m**

Answer FOUR Questions Only

QUESTION 01

1.1) Describe the difference between **data** and **information** using an example.

1.2) What is meant by Data Redundancy in file systems?

1.3) Compare and contrast the database system and file systems.

1.4) What are the advantages of Database Management Systems?

QUESTION 02

2.1) Define the following terms giving an example for each

i. Primary key
ii. Composite key
iii. Weak Entity
iv. Candidate key

2.2)

a) Draw an ER diagram for the following situation stating appropriate assumptions.

A personal computer (PC) consists of many essential hardware parts in its system unit. These hardware parts could be a product of different manufacturers. A manufacturer sells these hardware parts through different resellers. Retail vendors order the hardware parts in large quantities from those resellers (not from manufacturers). Customers can only purchase these hardware parts from different retail vendors. A PC could be assembled from hardware parts purchased from a single vendor or from multiple vendors. Multiple PCs could be owned by a single customer.

b) Give relations with appropriate attributes matching the ER diagram you have drawn for 2.2 a) above.

QUESTION 03

3.1) Define an Entity in an Entity Relationship (ER) model.

3.2) Compare the conceptual database model with the Implementation database model.

3.3) What are the four basic modeling concepts in Relational database model?

3.4) Briefly describe the terms Hardware, Software, People & Procedures in the context of database system environment.

QUESTION 04

4.1) What are the responsibilities of a DBA (Database Administrator)?

4.2) Explain the Three types of relationships that can exist in a relational model with suitable examples.

4.3) Read the following description about an AIRLINE system in a certain country and clearly showing the connectivity between entities; draw the complete ER diagram for the process.

A country has several airlines and they need to keep records on the processes in them. Each airline has an ID to identify them, an interesting name and a location.

An airline owns many airplanes. Each plane has an ID, type, amount of weight it can take and manufactured date.

Each airline employees many pilots to fly their planes. They have an ID to identify them. Also they keep pilot name, age, flying hours, gender and their citizenship. A pilot may own citizenship in many countries.

QUESTION 05

5.1) Why normalization is required for a relation?

5.2) State the rules/steps that are necessary to have a relation in the following normal forms.

i. First Normal Form (1NF)
ii. Second Normal Form (2NF)
iii. Third Normal Form (3NF)

5.3) Obtain the 1NF, 2NF, 3NF and BCNF relations from the following table. State assumptions you make.

(Note: Charge_Hour is depend on Job_Class)

Proj_Num	Proj_Name	Emp_Num	Emp_Name	Job_Class	Charge_Hour	Hours
15	A	103	Janaka	Programmer	35.75	23
15	A	101	Kumara	Designer	105.00	19
20	E	103	Janaka	Programmer	35.75	35
24	B	107	Kelum	Engineer	84.00	12
24	B	101	Kumara	Designer	105.00	45

QUESTION 06

6.1) Briefly describe the uses the following SQL commands.

I. Delete command
II. Insert command
III. Update command

6.2) The following relational schema illustrates the employee database maintained by the IT department of ABCD Company.

EMPLOYEE (EmpNum, EmpName, EmpAdd, EmpSalary, EmpAge, ManagerID)

PROJECT (ProjCode, StartDate, TimeAllocate, Venue, ManagerID)

ENROLLED (EmpNum, ProjCode)

MANAGER (ManagerID, Name, DepID)

Write SQL statements to perform the following tasks.

a. Create a database called ABCD.db
b. Create tables called EMPLOYEE, PROJECT, ENROLLED and MANAGER in the database, ABCD.db.
c. Change the Venue field of the newly created PROJECT table to hold 40 characters.
d. Retrieve the ManagerID and DepID of the MANAGER table whose name is 'Saman'.
e. Find (display) all the details of the employee from EMPLOYEE table whose EmpSalary is less than 20,000.