



**EASTERN UNIVERSITY, SRI LANKA**  
**SECOND EXAMINATION IN SCIENCE –2013/2014**  
**SECOND SEMESTER (Sept /Oct., 2016)**  
**CS 203 – DATABASE DESIGN**  
**(PROPER & REPEAT)**

Answer all Questions

Time: 2 Hours

- What do you mean by “Database Management System (DBMS)”?
- List five (05) advantages of “Database Management System (DBMS)”.
- A file based system is a collection of application programs that perform services for the users wishing to access information. List five (05) disadvantages of the file based system.
- Briefly describe “Data Definition Language (DDL)” and “Data Manipulation Language (DML)” with example.
- Describe “Primary key” and “Foreign key” with a suitable example.

What do you understand by “Entity Relationship (ER)” Model?

Briefly state the following terms;

- Entity
- Key attribute
- Composite attribute
- Relationships

Identify possible entities and attributes from the following set of statements to design a database for college and draw an ER diagram and indicate the cardinalities.

Set of statements:

- A college contains many departments.
- Each department can offer any number of courses.
- Many instructors can work in a department.
- An instructor can work only in one department.

- e. For each department there is a Head.
- f. An instructor can be a head of only one department.
- g. Each instructor can take any number of courses.
- h. A course can be taken by only one instructor.
- i. A student can enroll for any number of courses.
- j. Each course can have any number of students.

Q3)

- i) What do you mean by the term "Normalization"?
- ii) There are three types of anomalies that occur when the database is not normalized. Explain those three with suitable example.
- iii) Discuss the following normal forms with examples:
  - a. First normal form
  - b. Second normal form
  - c. Third normal form
  - d. Boyce Codd normal form
- iv) The following table shows a snapshot of a Construction Company. Describe the process of normalizing the below table into third normal form.

Department	Employee ID	Employee Name	Job Title	Salary
Evergreen	103	June E. Arbough	Elect. Engineer	\$84.50
	101	John G. News	Database Designer	\$105.00
	105	Alice K. Johnson *	Database Designer	\$105.00
	106	William Smithfield	Programmer	\$35.75
	102	David H. Senior	Systems Analyst	\$98.75
Amber Wave	114	Annelise Jones	Applications Designer	\$48.10
	118	James J. Frommer	General Support	\$18.36
	104	Anne K. Ramoras *	Systems Analyst	\$96.75
	112	Darlene M. Smithson	DSS Analyst	\$45.95
	105	Alice K. Johnson	Database Designer	\$105.00
Rolling Tide	104	Anne K. Ramoras	Systems Analyst	\$96.75
	113	Delbert K. Joenbrood *	Applications Designer	\$48.10
	111	Geoff B. Wabash	Clerical Support	\$26.87
	106	William Smithfield	Programmer	\$35.75
	107	Maria D. Alonzo	Programmer	\$35.75
Starflight	115	Trevi B. Bawang	Systems Analyst	\$96.75
	101	John G. News *	Database Designer	\$105.00
	114	Annelise Jones	Applications Designer	\$48.10
	108	Ralph B. Washington	Systems Analyst	\$96.75
	118	James J. Frommer	General Support	\$18.36
	112	Darlene M. Smithson	DSS Analyst	\$45.95

Consider the "Faculty" database given below:

Student

No	Student Name	Address	Year Study	Sex	Date	Course No
	Sylvester.A	Ampara	1	M	17/01/68	C1
	Perumal.K	Badulla	2	M	15/12/69	C2
	Dias.K	Colombo	1	F	17/01/69	C1
	Bandara.J	Galle	3	M	22/07/77	C1
	Kamala.N	Colombo	3	F	20/03/65	C2
	Dias.N	Matara	2	F	22/04/69	C2
	Soyza.P	Kandy	2	M	12/01/69	C1
	Banda.C	Kandy	2	M	29/01/68	C1

Result

No	Subject No	Year Exam	Marks
01	SU03	1	69
01	SU04	1	70
01	SU05	1	71
03	SU01	1	51
03	SU02	1	52
03	SU03	1	59
03	SU01	2	61

Department

Dept Name	Head
Mathematics	Ram.P.Mr
Chemistry	Senthil.M.Mrs.Dr
Botany	Ravima.N.Mrs
Zoology	Krishnaraj.P.Mrs.Dr
ComputerScience	Senthan.S.Mr.Dr
Physics	Jeyanathan.L.Mr.Dr

Consists

No	Subject No
	SU01
	SU02
	SU03
	SU03
	SU04
	SU05

Course

Course No	Title	Duration
C1	PhysicalScience	3
C2	BioScience	3
C3	Law	4

SQL statements for the following:

- Retrieve the names of all students who are in the third year.
- Retrieve the course number(s) which currently have students.
- Increase the marks of all subjects by 10% and display the student number, original marks and scaled marks.
- Retrieve student number who are in "first year" and were born on "17/1/68".
- List the head of departments who have the initial "S".
- List the name of students whose surname is "Dias".
- List the name of students who are from "Colombo", "Galle" and "Kandy".
- Get the total number of students who are following the subject "SU02".
- List the name of students who studied the subject SU04.

j. Add the following data to the STUDENT table;

Student Number : S1008

Student Name : Kethees.S

Course Number: C3

ii) State the term "Relational Algebra".

iii) Briefly describe the following term;

a. Select

b. Project

c. Cartesian product

d. Union