

EASTERN UNIVERSITY, SRILANKA
DEPARTMENT OF MATHEMATICS
SECOND EXAMINATION IN SCIENCE-2008/2009
SECOND SEMESTER (Oct, /Nov, 2010)
CS 203 – DATABASE DESIGN
(REPEAT and RE-REPEAT)

Answer all Questions

Time allowed: 2 hours

01.

a) Define the following terms:

- i. Database;
- ii. Database Management System (DBMS).

b) Why would you choose a database system instead of simply storing data in operating system files?

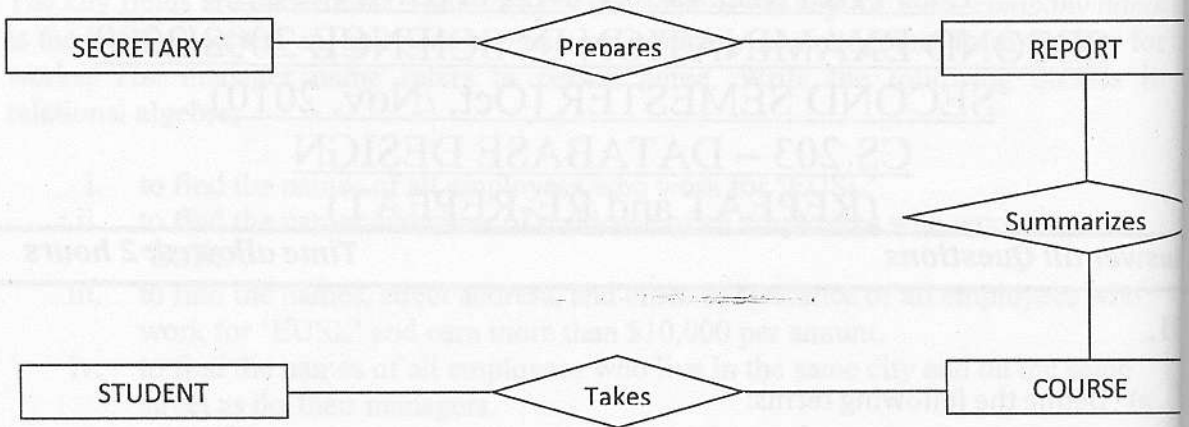
c) Briefly describe the following:

- i. Limitation of the processing system;
- ii. Components of DBMS environment;
- iii. Database Life Cycle.

02.

a) Explain in your own words or through an example the following terms: attribute domain, entity, weak entity, key attribute, derived attribute, multivalued attribute, and entity – relationship model.

b) A department in a university keeps the information about the students and courses offered in a database. The secretary manages the database. In the end of the semester, secretary prepares a report about each course.



Is the above E-R diagram of the database correct? If no, explain why and draw the correct diagram.

c) Consider the following set of requirements for a University database. Design an ER diagram for this application:

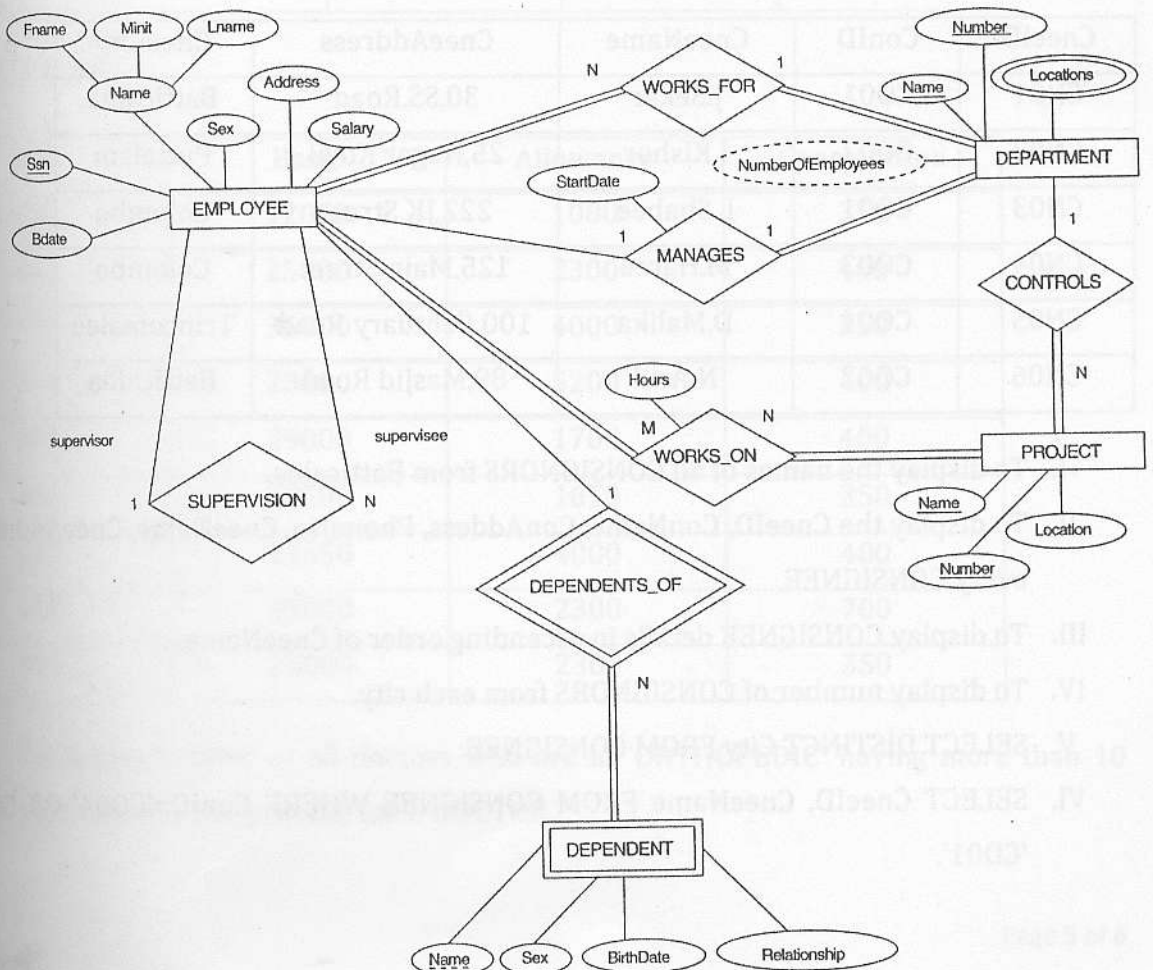
- The university keeps track of each student's name, student number, social security number, current address and phone number, permanent address and phone number, birthdate, sex, class (freshman, graduate), major department, minor department (if any), degree program (B.A., B.S., ... Ph.D.). Some user applications need to refer to the city, state, and zip code of the student's permanent address and to the student's last name. Both social security number and student number are unique for each student. All students will have at least a major department.
- Each department is described by a name, department code, office number, office phone, and college. Both the name and code have unique values for each department.
- Each course has a course name, description, course number, number of credits, level and offering department. The course number is unique for each course.

- Each section has an instructor, semester, year, course, and section number. The section number distinguishes sections of the same course that are taught during the same semester/year; its value is an integer (1, 2, 3, ... up to the number of sections taught during each semester).
- A grade report must be generated for each student that lists the section, letter grade, and numeric grade (0,1,2,3, or 4) for each student and calculates his or her average GPA.



03.

- What is a data model?
- What is the purpose of data model?
- Describe the Mapping Cardinalities with suitable examples.
- Describe ER- to -Relational Mapping algorithm.
- Convert the following ER diagram to relational model.



Q4)

a) Consider the following tables **CONSIGNOR** and **CONSIGNEE**. Write SQL commands for the statements (I) to (IV) and give outputs for the SQL queries (V) and (VI).

TABLE: CONSIGNOR

ConID	ConName	ConAddress	City	PhoneNo
CO01	A.Arjun	12,Pioneer Road	Batticaloa	0652225412
CO02	L.Lalith	25,Love Lane	Trincomalee	0262225487
CO03	I.Paakee	45/7, Amman Road	Kandy	0282245896
CO04	S.Saji	15, H.P Road	Batticaloa	0652222333

TABLE: CONSIGNEE

CneeID	ConID	CneeName	CneeAddress	CneeCity
CN01	CO01	J.Sekar	30,SS.Road	Batticaloa
CN02	CO02	I.Kishor	25,Nagar Kovil	Puttalam
CN03	CO01	L.Shabee	222,JK Street	Colombo
CN04	CO03	M.Haree	125,Main Street	Colombo
CN05	CO04	D.Malika	100.Centuary Road	Trincomalee
CN06	CO02	N.Arul	89,Masjid Road	Batticaloa

- I. To display the names of all CONSIGNORS from Batticaloa.
- II. To display the CneeID, ConName, ConAddress, PhoneNo, CneeName, CneeAddress for every CONSIGNEE.
- III. To display CONSIGNEE details in ascending order of CneeName.
- IV. To display number of CONSIGNORS from each city.
- V. SELECT DISTINCT City FROM CONSIGNEE;
- VI. SELECT CneeID, CneeName FROM CONSIGNEE WHERE ConID='CO04' OR ConID='CO01'.

b) Consider the following tables **DOCTOR** and **SALARY** and write SQL commands for the statements (I) to (IV) and give outputs for SQL queries (V) and (VI).



TABLE: DOCTOR

DID	DName	Dept	Sex	Experience
001	Sritharan	ENT	M	12
002	Sriharan	ORTHOPEDIC	M	06
003	John	CARDIOLOGY	M	10
004	H.Smith	SKIN	F	5
005	A.Peterson	MEDICINE	F	9
006	Vitory	ORTHOPEDIC	M	15
007	Taylor	ENT	F	2
009	M.Waugh	MEDICINE	M	11
011	S.Waugh	ORTHOPEDIC	M	12

TABLE: SALARY

DID	Basic	Allowance	Consultation
001	12000	1000	350
002	25000	2300	400
003	36000	4000	350
004	28000	5200	400
005	29000	1700	400
006	18500	1650	350
007	21550	4000	400
009	45000	2300	700
011	25000	2300	350

i. To display DName of all doctors who are in 'ORTHOPEDIC' having more than 10 years experience form the table DOCTOR..

- II. To display the average salary of all doctors working in 'ENT' department using the tables DOCTOR and SALARY. Salary= Basic + Allowance.
- III. To display the maximum ALLOWANCE of female doctors.
- IV. To display the lowest consultation fee among all male doctors.
- V. SELECT count (*) FROM DOCTOR WHERE SEX = 'F'.
- VI. SELECT DName,Dept, Basic FROM DOCTOR, SALARY WHERE Dept= 'ENT' AND DOCTOR.DID = SALARY.DID.

Dept	DID	DName	Sex	Basic	Allowance	Salary
ENT	1001	M. Wang	M	5000	1000	6000
ENT	1002	Z. Wang	M	4500	900	5400
ENT	1003	Wang	F	3500	700	4200
ENT	1004	Wang	F	3000	600	3600
ENT	1005	Wang	F	2500	500	3000
ENT	1006	Wang	F	2000	400	2400
ENT	1007	Wang	F	1500	300	1800
ENT	1008	Wang	F	1000	200	1200
ENT	1009	Wang	F	500	100	600
ENT	1010	Wang	F	0	0	0