Universiti Malaysia PAHANG

Engineering • Technology • Creativity

FACULTY OF COMPUTER SYSTEMS & SOFTWARE ENGINEERING

FINAL EXAMINATION

COURSE	:	**DATABASE SYSTEM**
COURSE CODE	:	**DCI2033**
LECTURER	:	**NOORLIN MOHD ALI**
DATE	:	**29 JUNE 2010**
DURATION	:	**3 HOURS**
SESSION/SEMESTER	:	**SESSION 2009/2010 SEMESTER III**
PROGRAMME CODE	:	**DCS**

INSTRUCTIONS TO CANDIDATE:

1. This question paper consists of **FOUR (4)** questions. Answer **ALL** questions.
2. Write your answers in the answer booklet provided.
3. Answer EACH question on a new page.
4. All calculations and assumptions must be clearly shown.

EXAMINATION REQUIREMENTS:

1. **APPENDIX** – Table 4.0

DO NOT TURN THIS PAGE UNTIL YOU ARE TOLD TO DO SO

This examination paper consists of **EIGHT (8)** printed pages including the front page.

QUESTION 1

(a)   Describe **TWO (2)** basic data modeling components.

[2 Marks]

(b)   Describe the terms of **data independence** and **data abstraction**.

[4 Marks]

(c)   **Describe TWO (2)** advantages of Distributed Database implementation.

[4 Marks]

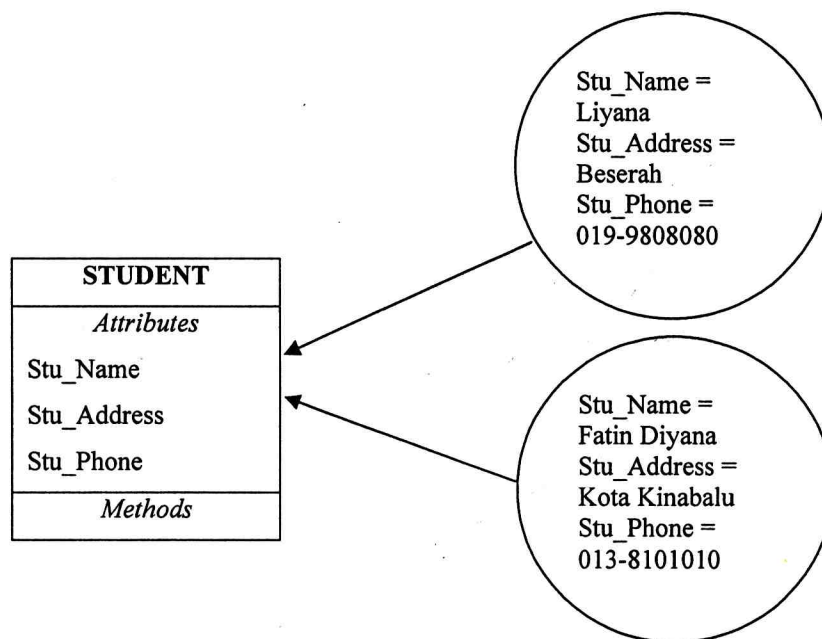(d)   Based on Figure 1, transform the diagram into a relation.

[3 Marks]

Figure 1

QUESTION 2

Examine the set of relations in Figure 2. Convert the relations into EER diagram.

[10 Marks]

```
DEPARTMENT (DEPT ID, DEPT_Name, DEPT_Location)
SALESREP (SR EMP ID, EMP_Name, EMP_Address, EMP_Phone,
          EMP_Salary, EMP_TaxID, SR_TotSales, SR_Commission,
          DEPT_ID)
SUPPORT (SP EMP ID, EMP_Name, EMP_Address, EMP_Phone,
          EMP_Salary, EMP_TaxID, SP_Area, SP_Certnum, SP_CertDate,
          DEPT_ID)
ADMIN (AD EMP ID, EMP_Name, EMP_Address, EMP_Phone,
          EMP_Salary, EMP_TaxID, ADM_Title, ADM_Bonus, DEPT_ID)
```

Figure 2

QUESTION 3

Taufiq Sports, a well-known football manager in Malaysia records the football league information for each of the league managed by this company. The following relations represent part of a database held in Taufiq Sports:

City   (**City ID**, City_Name)

Team   (**Team ID**, Team_Name, Team_Add, Team_Phone, Team_Status, Team_YearFormed, City_ID)

Player   (**Player ID**, Player_Name, Player_Add, Player_Phone, Player_Salary, Player_Bonus, Team_ID)

Game_Info   (**Home Team ID**, **Visit Team ID**, **Game ID**, GI_Home_Point, GI_Visit_Point)

Game   (**Game ID**, Game_Date, Game_Venue, Game_Time)

where

- City contains details of all cities in the registered in this league.
- Team contains details of team.
- Player contains details of the player for each team.
- Game_Info contains details of the each game between teams.
- Game contains details of the game scheduled.

(a) Based on the above relations, write the following queries in **QBE**:

    (i)   List the name of all teams with 'Active' status in ascending order.

                    [3 Marks]

    (ii)   Game_ID 'G70' has been postponed from 10/10/2009 to 20/10/2009 at 20:00.

                    [3 Marks]

    (iii) Calculate the average point for all games which are played by Team_Name 'FSKKP United'.

                    [5 Marks]

    (iv) Find the number of teams identified as "Not Active".

                    [4 Marks]

(b) Based on the above relations, formulate the following queries in **SQL**:

(i)   List the name of all active teams that are associated in the year 2009.

[3 Marks]

(ii)   The current bonus rates for all players are increased by 10%.

[4 Marks]

(iii)   Harimau Kuat team with `Team_ID` Q077 was one of the teams for this league. However, this team announced to withdraw from this league last week. Delete all records of this team from the database.

[4 Marks]

(iv)   List the player name (s) of the team formed in 2007 who earned bonus more than basic salary (*hint:* `Player_Bonus >Player_Salary`).

[4 Marks]

(v)   List the name of all players who receive salary rate more than RM8,000 (in descending order) and list also the name of their team.

[5 Marks]

(vi)   List the date of all games played in the stadium which name contains 'Sultan'.

[3 Marks]

(vii) Name the team (s) that win (s) in every match in this league.

[7 Marks]

(c) Based on the above relations, **translate** the following commands into plain English and **indicate their results** by showing the data:

(i)

Game	Game_ID	Game_Date	Game_Venue	Game_Time
		P.DO (1)	'Padang MPK'	P.AO(2)

[3 Marks]

(ii)

Game _Info	Home_ Team_ID	Visit_ Team_ID	Game _ID	GI_Home_ Point	GI_Visit_Point
	'Real UMP'	'Shahputra United'	_X		

Game	Game_ID	Game_Date	Game_Venue	Game_Time
	P._X	P._Y		

[3 Marks]

QUESTION 4

Unit Kolej Kediaman UMP maintains a list of compounds issued to fine violence in the campus hostels. Table 4.0 shows a portion of this list for the Semester I 2009/10 (refer to the Appendix for Table 4.0).

(a)   Provide **ONE (1)** example of **insertion, deletion, and modification** anomalies that can result in using this relation.

[3 Marks]

(b)   Draw a Functional Dependency Diagram that shows:
       (i)   The primary key
       (ii)   Partial Dependencies (if any)
       (iii)   Transitive Dependencies (if any)

[8 Marks]

(c)   Transform this compound into a relation.

[2 Marks]

(d)   Normalize your relation in (c) to Third Normal Form (3NF). **Describe** and **illustrate** each of the steps. Identify the primary and foreign keys in your 3NF relations.

[13 Marks]

END OF QUESTION PAPER

APPENDIX

Table 4.0

StuID	StuName	StuSurname	StuPhone	Room_Num	Block_ID	Kolej_ID	Compound _Num	Compound _Date	Violation Code	Violation Type	Fine
CC08100	Fadhirul Izwan	Abd Hadi	013-1234567	02-218	C1	KK1	15989	17/7/2009	1	No electrical appliances sticker	RM50
							16740	20/8/2009	3	Room messy	RM30
CC08300	Ahmad Muzammil	Abd Rahman	019-9876543	03-110	K	KK2	15900	17/7/2009	2	Illegal Resident	RM20
							16800	20/9/2009	1	No electrical appliances sticker	RM50
							19110	10/10/2009	3	Room messy	RM30
CC08900	Muhd Nazrin	Almi	013-4567890	03-218	C1	KK1	15877	17/7/2009	1	No electrical appliances sticker	RM50
							16125	20/9/2009	2	Illegal Resident	RM20