DHARMSINH DESAI UNIVERSITY, NADIAD
FACULTY OF TECHNOLOGY
B.TECH. SEMESTER V [INFORMATION TECHNOLOGY]
SUBJECT: (IT 502) DATABASE MANAGEMENT SYSTEM

Examination	: First Sessional	Seat No.	:	
Date	: 01/08/2017	Day	: Tuesday	
Time	: 11.30 to 12.45	Max. Marks	: 36	

INSTRUCTIONS:
1. Figures to the right indicate maximum marks for that question.
2. The symbols used carry their usual meanings.
3. Assume suitable data, if required & mention them clearly.
4. Draw neat sketches wherever necessary.

Do as directed.

(a) Given an instance of the **STUDENTS** relation as shown below: **[2]**

student_ID	student_name	student_email	student_age	student_cpi
7862	Vishnu	vishnu@cs	19	7.7
1289	Indra	indra@math	20	8.8
1359	Vishnu	vishnu@ee	18	9.9
5214	Indra	indra@ee	X	8.5

For (**student_name, student_age**) to be a primary key for this instance, the value of X should NOT be equal to _____.

(b) With regard to the expressive power of the formal relational query languages, which of the following **[2]** statement is true?
(A) Relational algebra is more powerful than relational calculus.
(B) Relational algebra has the same power as relational calculus.
(C) Relational algebra has the same power as safe relational calculus.
(D) None of the above.

(c) Explain existence dependent entity set with example. **[2]**

(d) Explain the functionalities of DBA. **[2]**

(e) Explain referential integrity constraint with error message. How a user can automate the DML queries **[3]** on primary and secondary table in database?

(f) The natural join is equal to: **[1]**
(A) Cartesian Product
(B) Combination of Union and Cartesian product
(C) Combination of projection and Cartesian product
(D) Combination of selection and Cartesian product

Q.2 Attempt *Any Two* from the following questions. **[12]**

(a) Design an **E-R diagram** for keeping track of the exploits of your favorite sports team. You should **[6]** store the matches played, the scores in each match, the players in each match and individual player statistics for each match. Summary statistics should be modeled as derived attributes. Also track the same information for all teams in a league. [Min. 4 entity sets]

(b) (i) What is the need of view? Explain types of views. Also write syntax for creating a view. **[3]**
(ii) Design a **generalization–specialization hierarchy** for a motor-vehicle sales company. The **[3]** company sells motorcycles, passenger cars, vans, and buses. Justify your placement of attributes at each level of the hierarchy. Explain why they should not be placed at a higher or lower level.

(c) Draw and explain functional components of database system. **[6]**

Q.3 (a) Write down SQL Query for the following **SCHEMA 1**. (note: SS# is Social Security Number) **[6]**
PERSON (SS#, NAME, ADDRESS)
CAR (REGISTRATION_NUMBER,SS# YEAR, MODEL)
ACCIDENT (DATE, DRIVER#, CAR_REG_NO)
OWNS (SS#, LICENSE)
(i) Delete all owner details effective and efficient way. [1]
(ii) Change the accident date from '02/02/2017' to '02/02/2016' for the CAR_REG_NO [1] 'CSR253612'.
(iii) Find the names of persons who are involved in an accident. [2]
(iv) Find the registration number of cars which were not involved in any accident. [2]

(b) **Write the Tuple Relational Calculus queries for the following [Use SCHEMA 1].** **[6]**
(i) Find all persons information who have same address as 'Sumit'. [2]
(ii) Retrieve cars information whose driver no is 'DR005' [2]
(iii) Retrieve name and license of the persons who have car model 'Toyota Fortuner' [2]

OR

Q.3 (a) Write down relational algebra for the following problems. **[Use SCHEMA 1].**
(i) Delete all owner details whose license no is 'GJ2789500'. [2]
(ii) Find the names of persons who are involved in an accident. [2]
(iii) Find the registration number of cars which were not involved in any accident. [2]

(b) **Write the Domain Relational Calculus queries for the following [Use SCHEMA 1].** **[6]**
(i) Find all persons information who has same address as 'Sumit'. [2]
(ii) Retrieve cars information whose driver no is 'DR005' [2]
(iii) Retrieve name and license of the persons who have car model 'Toyota Fortuner' [2]