Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

MCA- Ist SEMESTER–EXAMINATION – MAY/JUNE - 2012

Subject code: 610005 **Date: 04/06/2012**

Subject Name: Database Management Systems-I

Time: 02:30 pm – 05:00 pm **Total Marks: 70**

Instructions:

1. **Attempt all questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**

Q.1 **(a)** Consider the Following relation: **07**

Examination (student_id, name, subject_code), paper_code, maximum_marks, pass_fail, examination_date, exam_centre_code, marks_obtained_by_student

(i) Explain at least three anomalies in the relation above.

(ii) Identify the functional dependencies in the relation. Identify the primary key of the relation.

(iii) Normalise the relation to 2NF and 3NF.

(b) A Weak entity set can always be made into strong entity set by adding to its attributes the primary key attributes of its identifying entity set. Out line what sort of redundancy will result if we do so? **07**

Q.2 **(a)** Why Required Data materialization. Give the Detail of Representation of Storage structure with help of example. **07**

(b) What do you understand by the term data model? Explain the difference between a Data Model and its implementation. Why is the difference important? **07**

OR

(b) What do you mean by data dictionary? Explain the structure of data dictionary and also describe which types of view used by data dictionary. **07**

Q.3 **(a)** Consider the following requirement of a Company: **07**

(i) The Company is organised into departments. Each department has a name, unique number, and a particular employee who manages the department.

(ii) A department controls a number of projects, each of which has a name, a unique number and a single location.

(iii) An employee has name id#, address, salary, sex, birthdate. An employee is assigned to one department but may work on several projects.

(iv) We are keeping track of the dependents of each employee for insurance purpose. We keep each dependent's name, sex, birthdate, relationship of the employee.

Draw the E-R diagram for the company. Make suitable assumption, if any. Explain all the Relationship in your E-R diagram also explains relationship cardinality and participation constraint.

(b) Explain in the context of DBMS, with the help of an example or diagram Database Manager. **07**

OR

Q.3 **(a)** Consider the following requirement of a staff management of an Organisation: **07**

(i) The basic information of that needs to be stored about the staff includes staff-id, name, address, date of birth, date of employment, post held.

(ii) It keeps dependent information of employees. An employee can have many dependents.

(iii) Pay detail of the employees are also kept.

(iv) It also keeps track of the various departments and employees of those departments.

Draw the E-R diagram for the organization. Make suitable assumptions, if any. Explain all the Relationship in your E-R diagram also explains relationship cardinality and participation constraint.

(b) What are the responsibilities of a DBA? if we assume that the DBA is never interested in running his or her own queries does the DBA still need to understand query optimization? Why? **07**

Q.4 **(a)** Prove candidate key is minimal of super key also give the deference between candidate key and primary key. With help of designing. **07**

(b) Differentiate between the **07**

(i) Physical Data Independence and Logical Data Independence

(ii) File Base System and DBMS.

OR

Q.4 **(a)** Prove the statement "Every relation which is BCNF is in 3NF but converse is not true". **07**

(b) What are the insertion, deletion and update anomalies that occur in a database? Explain the mechanism to remove these anomalies from tables with the help of an example. **07**

Q.5 **(a)** What is dependency preservation property for decomposition? Why is it important? What is the lossless join property of decomposition why is it important? **07**

(b) Why normalisation of database done? Discuss synthesis and decomposition approach of normalisation with an example. **07**

OR

Q.5 **(a)** Explain the demerits of 4NF.Why need PJNF. Give the Representation of PJNF. **07**

(b) Given the relation r(R) shows below, state whether or not the following functional dependences are satisfied by the relation or cannot be determined. Give reason for your answers. **07**

A --> B, A --> C, AB --> C , C --> A , BC--> A , AC --> B , B --> A

r(R)

A	B	C
1	4	2
3	5	6
3	4	6
7	3	8
9	1	0

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