Reg. No.										

MANIPAL INSTITUTE OF TECHNOLOGY, MANIPAL 576104

(Constituent College of Manipal University)

FOURTH SEMESTER B.Tech. (IT) DEGREE MAKEUP EXAMINATION, JUL-2016
SUBJECT: DATABASE SYSTEMS (ICT-2203)
(REVISED CREDIT SYSTEM)

TIME: 3 HOURS **05/07/2016** **MAX. MARKS: 50**

Instructions to candidates

- Answer all questions
- Missing data, if any, may be suitably assumed

1A. Explain the different variations of two-phase locking method to assure serializability.

1B. Explain insertion, deletion and modification anomaly with example for each.

1C. How are views different from tables? What are Materialized Views?

(5+3+2)

2A. Consider the employee database given in Figure Q.2A, where the primary keys are underlined. Assume people work for exactly one company.

EMPLOYEE(employee-name, street, city)
WORKS(employee-name, company-name, salary)
COMPANY(company-name, city)
MANAGES(employee-name, manager-name)

Figure Q.2A

Give an expression in SQL for each of the following queries:

i. Find the names and cities of residence of all employees who work for First Bank Corporation.

ii. Find the names, street addresses and cities of residence of all employees who work for First Bank Corporation and earn more than ₹10,000.

iii. Find all employees in the database who live in the same cities as the companies for which they work.

iv. Find all employees in the database who do not work for First Bank Corporation.

v. Find all employees in the database who live in same cities and on the same streets as their managers.

2B. What is deferred update technique? Explain with suitable example.

2C. Test whether the schedule S: $r_1(X)$; $w_1(X)$; $r_2(X)$; $r_1(Y)$; $w_2(X)$; c_2; a_1 is recoverable or not. Justify the answer.

(5+3+2)

3A. Mention the condition for BCNF and check whether given functional dependency sets are equivalence or not. F = { A→C, AC→D, E→AD, E→H } and G = { A→ CD, E→ AH }

3B. What are the different end users of database? Explain with suitable examples.

3C. State the normal form rules for the following:
i. 1NF ii. 2NF iii. 3NF

(5+3+2)

4A. What do you mean by schedule is view equivalent? Check whether the schedules given in Figure Q.4A is View Serializable and Conflict serializable or not. Justify.

T_1	T_2
read(A)	
write(A)	
	read(A)
	write(A)
read(B)	
write(B)	
	read(B)
	write(B)

Schedule 2

T_1	T_2
read(A)	
write(A)	
read(B)	
write(B)	
	read(A)
	write(A)
	read(B)
	write(B)

Schedule 2

Figure Q.4A

4B. Explain the following with suitable example:

i. Composite Attribute

ii. Descriptive Attribute

4C. Define a PL/SQL function which returns the count of the number of instructors in that department. The name of the department is given as input to the function.

INSTRUCTOR(id, name, salary, deptname);
DEPARTMENT(deptname, deptLocation, budget)

(5+3+2)

5A. Consider the following information about a university database:

- Professors have an SSN, a name, an age, a rank, and a research specialty.
- Projects have a project number, a sponsor name (e.g., NSF), a starting date, an ending date, and a budget.
- Graduate students have an SSN, a name, an age, and a degree program (e.g., M.S. or Ph.D.).
- Each project is managed by one professor (known as the projects principal investigator).
- Each project is worked on by one or more professors (known as the projects co-investigators).
- Professors can manage and/or work on multiple projects.
- Each project is worked on by one or more graduate students (known as the projects research assistants).
- When graduate students work on a project, a professor must supervise their work on the project. Graduate students can work on multiple projects, in which case they will have a (potentially different) supervisor for each one.
- Departments have a department number, a department name, and a main office.
- Departments have a professor (known as the chairman) who runs the department.
- Professors work in one or more departments, and for each department that they work in, a time percentage is associated with their job.
- Graduate students have one major department in which they are working on their degree.
- Each graduate student has another, more senior graduate student (known as a student advisor) who advises him or her on what courses to take.

Design and draw an ER diagram that captures the information about the university.

5B. Check the following decomposition is lossless or lossy decomposition: R1 (A1, A2, A3, A5); R2 (A1, A3, A4); R3 (A4, A5) with FD1: A1 $\rightarrow$ A3, A5; FD2: A5 $\rightarrow$ A1, A4; FD3: A3, A4 $\rightarrow$ A2. Show each the step.

5C. Explain the transition states of a transaction with neat diagram.

(5+3+2)