Reg. No.										

MANIPAL INSTITUTE OF TECHNOLOGY

MANIPAL

A Constituent Institution of Manipal University

V SEMESTER B.TECH. (COMPUTER AND COMMUNICATION ENGINEERING)

MAKEUP EXAMINATIONS, DECEMBER 2017

SUBJECT: DATABASE SYSTEMS [ICT 3154]

REVISED CREDIT SYSTEM
(27/12/2017)

Time: 3 Hours MAX. MARKS: 50

Instructions to Candidates:

- Answer ALL the questions.
- Missing data may be suitably assumed.

1A. A database is being constructed to keep track of the teams and games of a sports league. A team has a number of players, not all of whom participate in each game. It is desired to keep track of the players participating in each game for each team, the positions they played in that game, and the result of the game. Design an ER schema diagram for this application and state all the assumptions. (Choose any one your favorite sport either soccer or football or baseball and design). Further, reduce the ER diagram to relations. 5

1B. Consider the following database schema: 3
Employee(Emp_Id, Emp_Name, Salary, Manager_Id, Dept) [Manager_id refers emp_id]
Using the above schema write SQL queries for the following:
i) Find all employee names along with their manager names.
ii) Find departments having employees with maximum salary. Assume that there are more than one employee with maximum salary from different departments.

1C. Discuss all the properties of a transaction using a single example. 2

2A. Given a relation R = (A, B, C, D, E, H) and Functional Dependencies F = {A -> BC, E -> HA}. Check in which normal form the relation R is? 5
If decomposition of relation R to higher normal forms are possible, then decompose relation R step by step and finally keep it in the highest normal form.

2B. Explain how the drawbacks of File processing system is overcome by Database System concept. 3

2C. Using the schema given in Q.1B, write SQL query to find departments whose total salary is greater than the average salary of all other departments. 2

3A. Describe the two approaches of Log based recovery along with suitable examples. Mention the advantages and disadvantages of each of the approaches. 5

3B. Give an algorithm to test Lossy and Dependency Preserving decomposition. 3

3C. Illustrate extended ER features with suitable examples. 2

4A. Mention suitable versions of Lock based protocols which eliminates Cascading roll backs and with suitable example explain how each version eliminates cascading rollbacks. Also describe Deadlock free version of the Lock based protocol with an example. 5

4B. Explain Grant and Revoke commands along with syntax. 3

4C. Mention and describe the approaches of Database Design. 2

5A. Consider the following database schema: 5
Instructor(Instructor_Id, Name, Department_No)
Taught(Course_No, Instructor_Id, No_of_Students)
Course(Course_No, Course_Name, Department_No)
Attendance(Student_Id, Course_No, Attendence_Percentage)

i. Using above schema, create a Trigger which is fired in the following scenario:
When number of courses in each department exceeds one, with each course having minimum ten students with attendance status less than 75%. Display such departments along with the courses. [For example: ICT Department with DBS and PP courses, where DBS and PP each has ten students with attendance status less than 75%].

ii. Using above schema, write a SQL query to display the instructor who teaches more than two courses from his department.

5B. What are database anomalies? Explain each of them using examples. 3

5C. Explain Validation Based protocol with a suitable example. 2