Reg. No.										

MANIPAL INSTITUTE OF TECHNOLOGY

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A Constituent Institute of MAHE, Manipal

IV SEMESTER B.TECH. (INFORMATION TECHNOLOGY) MAKE UP EXAMINATIONS, JUNE 2018

SUBJECT: DATABASE SYSTEMS [ICT 2203]

REVISED CREDIT SYSTEM
(21/06/2018)

Time: 3 Hours MAX. MARKS: 50

Instructions to Candidates:

- Answer **ALL** the questions.
- Missing data may be suitable assumed.

1A. Consider the following schema that contains details about movies.
Movies(title, year, length, studioName, producerName)
StarsIn(movieTitle, movieYear, starName)
MovieStar(name, address, gender, birthdate)
Studio(name, address)
Write the SQL query for the following

1. Find all the stars that appeared either in a movie made in year 2000 or a movie with "BAHUBALI" in the title.
2. List all the producers and number of movies who produced more than 10 movies.
3. List the titles of movies made by Ramoji Studios that either were made after year 2012 or were less than 120 minutes duration.
4. List the movies made in Ramoji Studios by length, shortest first, and among movies of equal length, alphabetically.
5. List all movie names of highest duration. **5**

1B. Explain the advantage of database approach over file based approach. **3**

1C. Find the canonical cover for the following functional dependencies of a relation R (A, B, C)
A→B, B→C, A→B, AB→C **2**

2A. What is a view? Explain with suitable example. Also explain how views are created using another view. **5**

2B. Discuss Timestamp based protocol. **3**

2C. What are weak entity set? Explain with suitable example. **2**

3A. Design an ER Diagram for keeping track of information about hospital database taking into account at least 4 main entities. Also convert the ER Diagram into schema diagram. **5**

3B. Write a procedure **ComputeNetSalary** which compute the net_salary of an employee. The input parameters to the procedure are employeeId, employeeName and monthly basic salary. The output parameter will be net_salary. Net salary is calculated using following formulae.
gross_salary = basic_salary +40% of basic_salary
net_salary = gross_salary – 10% of gross salary **3**

3C. What are the properties of the transaction? Also state the difference between partially committed and committed state. **2**

4A. Explain simple 2-phase locking protocol with suitable example. Consider the following schedule S1 and S2. Which of the schedules, using shared and exclusive locks, satisfy the requirements for strict two phase locking? State the reason. (S:Shared lock, X: Exclusive lock, C: commit, U:Unlock)

S1: S(A); R(A); X(B); R(B); W(B); U(A); C; U(B).
S2: S(B); R(B); X(A); R(A); W(A); U(A); U(B); C. **5**

4B. With suitable example discuss Scalar Query, Exists, and Subquery in From clause concepts. **3**

4C. Explain the following terms with suitable example i) schema ii) domain **2**

5A. What is a Multivalued Dependency (MVD)? Explain with an example, the process of removing MVD. For the following functional dependency sets F and G, check whether they are equivalent or not? **5**

F={A→C, AC→D, E→ADH} G={A→CD, E→AH}

5B. With an example explain Deferred and Immediate database modification recovery techniques. Also mention whether Undo and Redo operations are required by these techniques or not. **3**

5C. Consider the following two relational schemas. For each schema, all non-trivial functional dependencies are listed, the underlined attributes are the respective primary keys.

Schema I: Registration (rollno, courses)
Field *'courses'* is a set-valued attribute containing the set of courses a student has registered for.
Non-trivial functional dependency
rollno → courses

Schema II: Registration (rollno, coursid, email)
Non-trivial functional dependencies:
rollno, courseid → email
email → rollno
Which one of the relational schemas above is in 3NF but not in BCNF? State the reason. **2**