Reg. No.										

MANIPAL INSTITUTE OF TECHNOLOGY

MANIPAL

A Constituent unit of MAHE, Manipal

VI SEMESTER B.TECH. (COMPUTER SCIENCE & ENGINEERING)

END SEM EXAMINATIONS, MAY 2019

SUBJECT: DATABASE MANAGEMENT SYSTEMS[CSE 3281](OE)

REVISED CREDIT SYSTEM
(06/05/2019)

Time: 3 Hours MAX. MARKS: 50

Instructions to Candidates:

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

1A. 1A. Consider the following College database schema:
. Course(CId, CName, DNo)
Department(DNo, DName, HODFId)
Faculty(FId, FName, Designation, Salary, DNo)
Handles(FId, CId)
Write the following queries in Relational Algebra
i) Find the name of all faculty who is not handling any course
ii) Find the name of the course handled by multiple faculty.
iii) Update the salary of all professors by 10%. 4M

1B.With a three level abstraction diagram explain how the developers hide the database complexity from the users. 4M

1C. With example explain the different data types supported by SQL. 2M

2A. Consider the following University database schema:
instructor (ID, NAME, DEPT_NAME, SALARY)
takes (ID, COURSE_ID, SEC_ID, SEM,YEAR,GRADE)
section (COURSE_ID, SEC_ID, SEM,YEAR, BUILDING, ROOMNO, TIMESLOT_ID)
teaches (ID, COURSE_ID, SEC_ID, SEM,YEAR)
Write the following queries in SQL
i) Find all instructors in Comp. Sci. Dept. with salary > 80000
ii) Find students who have registered for one or more courses both in Fall 2009 and in Spring 2010
iii) Find all instructors who have taught at least one course in every semester of different years recorded in the section relation. 4M

2B. Illustrate the following SQL operations with example.

i. Set comparison. ii. Aggregation with grouping. 4M

2C. Describe the role and usage of data definition language. Give SQL example for each. 2M

3A.With diagram explain different ways of representing cardinalities in an ER diagram. 4M

3B. Consider the ER diagram shown in Fig.3B. What is the minimum number of tables generated after reducing to relational schemas? Show all the steps involved. 4M

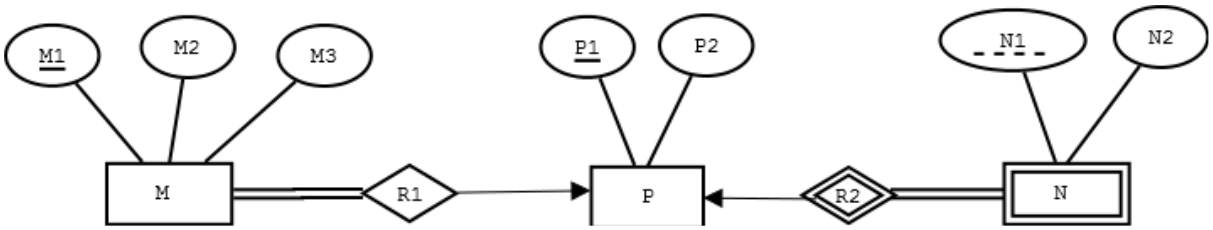

Fig .3B

3C. Explain rename operation in relational algebra with the help of an example. 2M

4A. Give an algorithm to find the closure of attribute sets. *Apply the algorithm to find* find $(AG)^+$ for the relation R = (A, B, C, G, H, I) with its functional dependencies:
F = { $A \rightarrow B$; $A \rightarrow C$; $CG \rightarrow H$; $CG \rightarrow I$; $B \rightarrow H$} 5M

4B. Consider the relation R(P,Q,R,S,T,U) and the set F of functional dependencies
F = { P →Q, R → SU, PR → T, S → U}
Assuming PR is the primary key check whether the relation is in 2NF and 3NF. 3M

4C. Suppose that we decompose the schema $R = (A, B, C, D, E)$ into
(A, B, C) and (A, D, E).
Show that this decomposition is a lossless-join decomposition if the following set F of functional dependencies holds:
$F\{ A \rightarrow BC;\ CD \rightarrow E\ ;\ B \rightarrow D\ ;\ E \rightarrow A\}$ 2M

5A. Explain Two-Phase Locking protocol and its variants that ensure serializabilty. 5M

5B.With a block diagram, explain the different states of a transaction. 3M

5C.With an example explain assignment operation in relational algebra. 2M