**MANIPAL INSTITUTE OF TECHNOLOGY**

**Department of Information and Communication Technology (I&CT)**

**Subject-Database Systems (ICT-** **2203)**

**IV semester B.Tech IT**

**Sessional- I, Time-1 Hour, Date-11/02/2017**

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1. \_\_\_\_\_\_\_ Key and \_\_\_\_\_\_\_ key can allow null value. **[1M\*5=5M]**

**Ans: Except Primary Key any other valid key – unique, foreign, super, candidate, composite, alternate**

1. Mention the join which retains all entries from only table T1

Select \* from T2 **Natural Right Outer Join** T1.

1. Complete the following query which fetches dept\_name in alphabetical order and name in reverse alphabetical order:

Select dept\_name, name from instructor **Order By dept\_name ASC, name DESC**

1. **like ‘%- - - raj’** String pattern is used to list out the student names which has at least 6 characters and ends with ‘raj’ word. (note: at least 6 characters including raj, mention the operator used as well along with pattern) (or **like ‘- - - %raj’)**
2. The ability to modify the physical schema without changing the logical schema is called **Physical Data Independence**
3. Find all the companies having highest number of Employees, using following relational schemas. **[2 Marks]**

Employee (Emp\_Id, Name, city, Company\_Id, Salary, Mgr\_Id) [Mgr\_Id references Emp\_Id of Employee table and Company\_Id references Company\_Id of Company table]

Company (Company\_Id, Name, City)

**Select Company\_Id , count (\*) as emp\_count from Employee**

**Group by Company\_Id**

**Having emp\_count = (Select max(Cmp\_emp\_count) from (select count(\*) as Cmp\_emp\_count**

**from Employee group by Company\_Id) )**

**OR**

**Select Comp\_Id, count(\*)**

**from Employee**

**group by comp\_id**

**having count(\*)= (select max(count(\*)) from Employee group by comp\_id);**

1. Using schemas in the question 6, find names of all the employees who earn more than the average salary of their company. **[2 Marks]**

**Select Emp\_Id**

**From Employee E1, lateral (select avg(salary) as avg\_sal from employee E2**

**where E2.company\_Id= E1.company\_Id)**

**where E1.salary > avg\_sal;**

1. Department (Dept\_Id, Name, Location) **[3 marks]**

Student (Student\_id, Name, Dept\_Id, Level\_Age)

Instructor (I\_Id, Name, Dept\_Id)

Course (Course\_Id, Name, Time, RoomNo, I\_Id)

Enrolled (Student\_Id, Course\_Id, Grade)

Get student names those who have an ‘A’ grade in all the courses they are enrolled in using above relational schemas.

**Select Student\_Id, Name from Student s**

**Where NOT EXISTS ((select Course\_Id from Enrolled where Student\_ID= s.Student\_Id)**

**EXCEPT**

**(select Course\_Id from Enrolled where Student\_Id = s.Student\_Id and**

**Grade=’A’) );**

OR

Select s.Student\_Id, count(\*) from Student s, Enrolled E where s.student\_Id = E.Student\_Id

And Grade=’A’ group by s.Student\_Id having count(\*) =

(Select count(\*) from Student s, Enrolled E where s.student\_Id = E.Student\_Id)

1. What is data model? Explain all the data models. **[3 Marks]**

Data Model is a A collection of tools for describing **[1 Mark]**

Data

Data relationships

Data semantics

Data constraints

Explaining any of the following 4 models **[2 Marks]**

Relational model

Network model

Hierarchical model

Entity-Relationship data model (mainly for database design)

Object-based data models (Object-oriented and Object-relational)

Semistructured data model (XML)