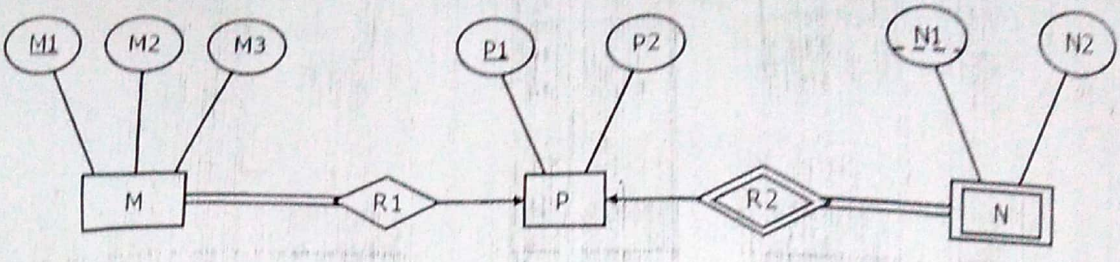
Minor Test
MCAE403: Database Applications

Time : 1 hr

Max Marks : 20

Q.1: Consider the following ER diagram:



The minimum number of tables needed to represent M, N, P, R1, R2 is 3 and the tables created would be M, N, P.

Justify your answer.

(2)

Q.2: The functional dependencies for relation R(ABCDE) are

{A->BC, CD->E, B->D, E->A}

(a) Find the highest normal form the R is in. (1)

(b) Convert the relation into the highest normal form (BCNF). (2)

(c) Check whether the decomposition is lossless and functional dependency preserving. (2)

Q.3: Differentiate between UNION and UNION ALL operators. Write two conditions which have to be fulfilled if you want to use INTERSECT operator. (2)

Q.4: Refer the relation given below: (4)

City(City_id: serial, **city**: varchar(50), **country_id**: int, **last_update**: timestamp)

a) Find the difference between the total number of CITY entries in the table and the number of distinct CITY entries in the table.
b) Find all the cities with even city_id.
c) Query the list of CITY names ending with vowels (i.e. a,e,i,o,u). Your result should not contain duplicate values.
d) Query the list of CITY names from the CITY table which have vowels (i.e., a, e, i, o, and u) as both their first and last characters. Your result cannot contain duplicates.

Q.5: Write SQL queries to do the following: **(4)**

a) Find the total number of products in each category. Sort the result by the total number of products, in descending order.

Product: **product_id**:smallint, **product_name**:varchar, **supplier_id**:smallint, **category_id**:smallint, **quantity_per_unit**:varchar(20), **unit_price**:real, **units_in_stock**:smallint, **units_on_order**:smallint, **reorder_level**:smallint, **discontinued**:integer

Categories: category_id: smallint, **category_name:** varchar(15), **description**:text, **picture**:bytea

b) Find the total number of customers per country and city.

Customers:
customer_id: smallint, **company_name:**varchar(50), **contact_name:**varchar(50), **contact_title:**varchar(50), **address:**varchar(50), **city:**varchar(50), **region:**varchar(50), **postal_code:**varchar(50), **country**,**phone:**varchar(50), **fax:**varchar(50)

c) A salesperson for NorthWind is going on a business trip to visit customers, and would like to see a list of all customers, sorted by region, alphabetically. However, he wants the customers with no region (null in the region field) to be at the end, instead of at the top. Within the same region, companies should be sorted by CustomerID. Refer table **Customers.**

d) Show a list of countries where the NorthWind company has customers. Refer table **Customers.**

Q.6: Write a query to show how the average order amount for each store compares to the minimum and maximum of the average order amount of all stores. (3)

orders_store(Id: int8, **date**: date, **customer_id**: int8, **store**: varchar, **employee_id**: int8, **amount**: numeric)

	store	average_order	min_avg_order	max_avg_order
0	Center	489.666667	338.5	725.0
1	East	338.500000	338.5	725.0
2	West	725.000000	338.5	725.0