North South University, Dept. of ECE
Midterm Examination, Section: 4, CSE311, Fall 2025
Duration: 1 hour 10 minutes, Full Marks: 60

Section: _____

ID: _____ Name: _____

Answer the following questions

Q1:

$2 \times 5 = 10$

Answer **any two** of the following questions:

Person (NID, name, street, thana, district, age, income, balance)

Purchase (item_id, NID, date, quantity, total_price)

Item (item_id, item_name, supplier_id, unit_price)

Supplier (supplier_id, s-name, street, thana, district, income)

a. Write relational algebra to find NID, name, income of all persons purchasing items supplied by supplier id 'S202'.
b. Write relational algebra to find the list of street, thana, district where both person and supplier live.
c. Write relational algebra to find NID, name, income of all persons whose income is same as the income of person name 'Sharif. There are more than one person with name 'Sharif'.

$5 \times 5 = 25$

Q2:

Answer **any five** of the following questions:

Person (NID, name, street, thana, district, age, income, balance)

Purchase (item_id, NID, date, month, year, quantity, total_price)

Item (item_id, item_name, supplier_id, unit_price)

Supplier (supplier_id, s-name, street, thana, district, income)

a. Write SQL to find NID, name of all persons whose name starts with 'M' or 'S' and age greater than 50.
b. Write SQL to find NID, name, item_id, item_name for all persons of 'Khulna' district.
c. Write SQL to find thana, district wise average and maximum income of all persons purchasing items in 2024.

WHERE (name LIKE 'M%' OR name LIKE 'S%'

FROM Person p
JOIN Purchase pu ON p.NID = pu.NID
JOIN Item i ON pu.item_id = i.item_id

FROM Person p
JOIN Purchase pu ON p.NID = pu.NID

```
EXISTS (
  SELECT 1
  FROM Purchase a
  JOIN Person pa ON a.NID = pa.NID
  WHERE pa.name = 'Abdullah'
   AND a.year = 2024
   AND a.item_id = pu.item_id
```

d. Write SQL to find item id wise total quantity purchased by persons in 2020 with total quantity less than 10. Show the result in ascending order of total quantity.

e. Write SQL to find NID, name of persons who has purchased any item purchased by 'Abdullah' in 2024.

f. Write SQL to find NID, item_id of persons who has purchased all items (item_id) purchased by person with NID = 1234567890.

```
WHERE NOT EXISTS (
  SELECT item_id
  FROM Purchase pt
  WHERE pt.NID = 1234567890
   AND NOT EXISTS (
    SELECT 1
    FROM Purchase p2p
    WHERE p2p.NID = p2.NID
     AND p2p.item_id = pt.item
```

Q3: Answer the following questions:

branch(branchName, branchCity, assets)
customer (customerName, customerStreet, customerCity, date-of-birth)
depositor (customerName, accountNumber)
account (accountNumber, branchName, balance)
customer_backup (customerName, customerStreet, customerCity, date-of-birth)

a. Write SQL to insert all customers with date of birth earlier than 1st January 1960 in customer_backup table.

```
INSERT INTO customer_backup
(customerName, customerStreet, customerCity,
date_of_birth)
SELECT customerName, customerStreet,
customerCity, date_of_birth
FROM customer
WHERE date_of_birth < '1960-01-01';
```

b. Write SQL to delete all depositors with customerCity 'Rajshahi'.

```
DELETE d
FROM depositor d
JOIN customer c ON d.customerName =
c.customerName
WHERE c.customerCity = 'Rajshahi';
```

Q4:

a. Given relations schema: r (A, B, C, D), s (C, D, E)

Write the correct form of the following SQL:

i) SELECT A, C, D FROM r, s WHERE r.C =s.C

```
SELECT r.A, r.C, r.D
FROM r
JOIN s ON r.C = s.C;
```

ii) SELECT A, D, SUM (E) FROM r, s GROUP BY A

```
SELECT r.A, r.D, SUM(s.E) AS sumE
FROM r
JOIN s ON r.C = s.C
GROUP BY r.A, r.D;
```

Q5: Given

Student (Id, name, tot_cred)

Takes (course-id, id, semester, year, GP, marks)

Course (course-id, title, credit-hour)

Write SQL to update tot_cred of all students by the summation of credit-hour of all courses taken by each student with marks >= 60.

```
UPDATE Student s
SET tot_cred = (
  SELECT (SUM(c.credit_hour))
  FROM Takes t
  JOIN Course c ON t.course_id = c.course_id
  WHERE t.id = s.Id
    AND t.marks >= 60
);
```