

## **DBMS Tutorial 1710/19 Solutions:**

1.  $\{t \mid t \in \text{loan} \wedge t[\text{amount}] \geq 10000\}$
2.  $\{t \mid \exists s \in \text{loan} (t[\text{loan number}] = s[\text{loan number}] \wedge s[\text{amount}] \geq 10000)\}$
3.  $\{t \mid \exists s \in \text{borrower} (t[\text{customer-name}] = s[\text{customer-name}]) \wedge \exists u \in \text{depositor} (t[\text{customer-name}] = u[\text{customer-name}])\}$
4.  $\{t \mid \exists s \in \text{borrower} (t[\text{customer-name}] = s[\text{customer-name}] \wedge \exists u \in \text{loan} (u[\text{branch-name}] = \text{"ABC"} \wedge u[\text{loan-number}] = s[\text{loan-number}]))\}$
5. DRC:

$\{(N, D) \mid \exists S(\text{Employeeh}_{\_ , \_ , \_ , N, \_ , D, S}) \wedge S > 100000\}$

or

$\{(N, D) \mid \exists E, F, M, W, S(\text{Employeeh}(E, F, M, N, W, D, S) \wedge S > 100000)\}$

TRC:

$\{W \mid \exists E (E \in \text{Employee} \wedge W[\text{lastname}] = E[\text{lastname}] \wedge W[\text{hiredate}] = E[\text{hiredate}] \wedge E[\text{salary}] > 100000)\}$

or

$\{W \mid \exists E \in \text{Employee} (W[\text{lastname}] = E[\text{lastname}] \wedge W[\text{hiredate}] = E[\text{hiredate}] \wedge E[\text{salary}] > 100000)\}$

6. DRC:

$\{(P, N) \mid \exists E (\text{Projecth}(P, \text{'E210'}, E, \_) \wedge \text{Employee}(E, \_, \_, N, \_, \_, \_))\}$

Domain Relational Calculus:

7.  $\{ \langle l, b, a \rangle \mid \langle l, b, a \rangle \in \text{loan} \wedge (a \geq 100) \}$
8.  $\{ \langle l \rangle \mid \exists b, a (\langle l, b, a \rangle \in \text{loan} \wedge (a \geq 150)) \}$
9.  $\{ \langle c, a \rangle \mid \exists l (\langle c, l \rangle \in \text{borrower} \wedge \exists b (\langle l, b, a \rangle \in \text{loan} \wedge (b = \text{"Main"}))) \}$