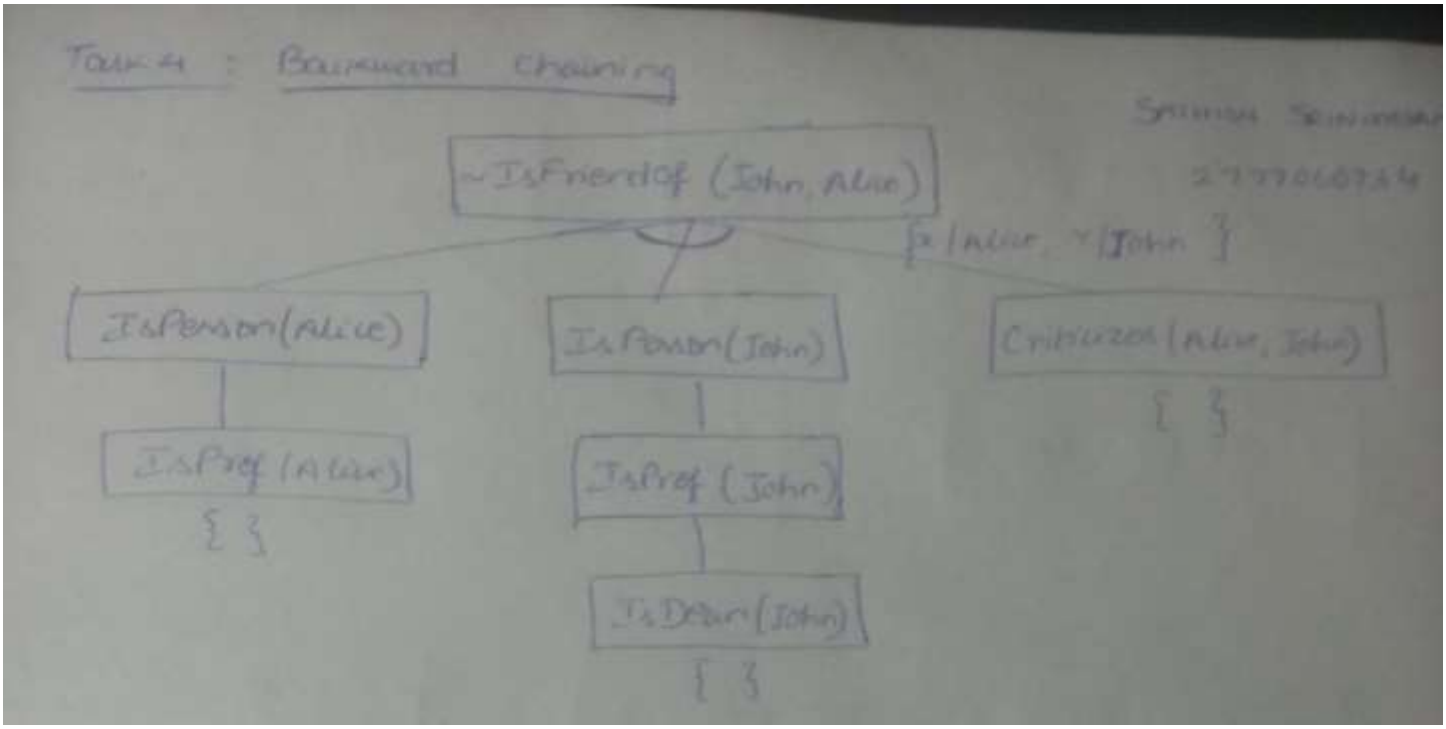

Task 4 : Backward Chaining
~IsFriendOf (John, Alice)
{x/Alice, y/John}
IsPerson(Alice)
IsPerson(John)
Criticizes(Alice, John)
{ }
IsProf(Alice)
IsProf(John)
{ }
IsDean(John)
{ }

Resolution :-

Conversion to CNF :-

1) IsProf (Alice)

2) $\forall x$ (IsProf(x) $\rightarrow$ IsPerson(x))

$\sim$(IsProf(x)) $\vee$ (IsPerson(x)) [Remove implication, drop universal quantifier

3) IsDean (John)

4) $\forall x$ (IsDean(x) $\rightarrow$ IsProf(x))

$\sim$(IsDean(x)) $\vee$ (IsProf(x)) [Remove implication, drop universal quantifier

5) $\forall x$ ($\forall y$ (IsProf(x) $\wedge$ IsDean(y) $\rightarrow$ IsfriendOf(y,x) $\vee \sim$knows(x,y)

$\sim$(IsProf(x) $\wedge$ IsDean(y)) $\vee$ (IsfriendOf(y,x)) $\vee$ ($\sim$knows(x,y

$\sim$IsProf(x) $\vee \sim$IsDean(y) $\vee$ IsfriendOf(y,x) $\vee$ ($\sim$knows(x,y)

6.) $\forall x \, (\exists y \, (IsFriendOf(y, x)))$

$IsFriendOf(F(x), x)$ [Skolemization, Dropping universal quantifi

7.) $\forall x \, (\forall y \, [IsPerson(x) \wedge IsPerson(y) \wedge Criticizes(x, y) \rightarrow \sim IsFriendOf($

$\sim(IsPerson(x) \wedge IsPerson(y) \wedge Criticizes(x, y)) \vee (\sim IsFriendOf(y, x))$

$(\sim IsPerson(x)) \vee (\sim IsPerson(y)) \vee (\sim Criticizes(x, y)) \vee (\sim IsFriendOf(y$

8.) $Criticizes(Alice, John)$

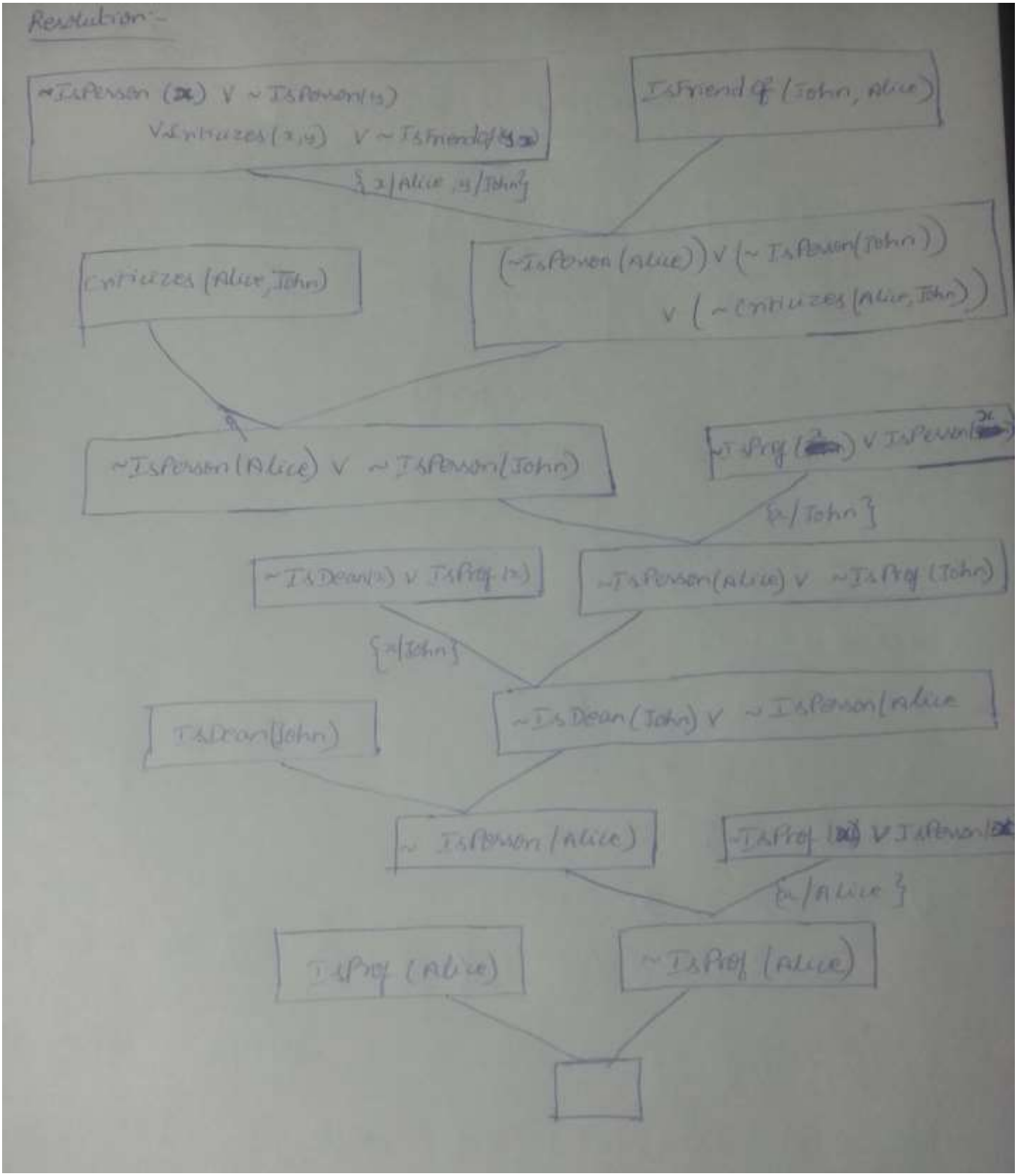
Alpha :-

$\sim IsFriendOf(John, Alice)$

Not alpha :-

$IsFriendOf(John, Alice)$

Resolution:-


~IsPerson(x) V ~IsPerson(y) V Criticizes(x,y) V ~IsFriendOf(y,x)
IsFriendOf(John, Alice)
{x/Alice, y/John}
Criticizes(Alice, John)
(~IsPerson(Alice)) V (~IsPerson(John)) V (~Criticizes(Alice, John))
~IsPerson(Alice) V ~IsPerson(John)
{x/John}
~IsDean(x) V IsProf(x)
~IsPerson(Alice) V ~IsProf(John)
{x/John}
IsDean(John)
~IsDean(John) V ~IsPerson(Alice)
~IsPerson(Alice)
{x/Alice}
IsProf(Alice)
~IsProf(Alice)