
Name:**Entry No.:**

1. [2 marks] Let F be a closed formula in Skolem form, $F = \forall^* G$, where G , in CNF, is given below:

$$\{\{T(a)\}, \{-T(x), \neg Q(f(x))\}, \{Q(f(y)), \neg P(x), Q(x)\}, \{P(x), \neg T(y)\}\}$$

Use resolution to prove that F is unsatisfiable.

2. [2 marks] A closed formula is in the class $\exists^*\forall^*$ if it has the form $\exists x_1 \dots \exists x_m \forall y_1 \dots \forall y_n F$, where F is quantifier-free and $m, n \geq 0$. Prove that if an $\exists^*\forall^*$ -formula over a signature with no function symbol has a model then it has a finite model.