Problem 1

p	$\neg p$	$(p \to \neg p)$	$(\neg p \to p)$	$((p \to \neg p) \vee (\neg p \to p)$
T	F	F	T	T
F	T	T	F	T

Problem 2

A tautology is a proposition which is true for any combination of truth values. An example from modal logic would be the following:

Let $w_1 = \{p\}$ and $w_2 = \{p\}$. Thus, $\Box p$ is tautology in this model.

Problem 3

Yes. For all entities in the model, $\{a, b, c\}$, $G(x, x)$ is true.

Problem 4

$G(a, a) \wedge G(b, b) \wedge G(c, c)$.