

VU Programm- und Systemverifikation

Solution to Homework: Propositional Logic / SAT

June 5, 2017

1. Consider the following formulas; are they satisfiable? If yes, provide a satisfying assignment, if not, give the reasoning that leads to this conclusion.

(a) $\neg a \wedge (\neg b \vee a) \wedge (\neg c \vee a) \wedge (\neg b \vee c \vee \neg a) \wedge (b \vee c)$

(b) $a \wedge (c \vee b) \wedge (\neg b \vee a) \wedge (\neg c \vee b \vee \neg a) \wedge (\neg c \vee \neg a)$

(c) $\neg(a \rightarrow b) \wedge (\neg a \vee b)$

(d) $(b \vee a) \wedge (\neg b \vee \neg a) \wedge (b \rightarrow a)$

2. Convert the following formula into conjunctive normal form (CNF) by applying **Tseitin transformation only**.

$$(a \vee b) \vee \neg((c \wedge d) \vee \neg e)$$

Upload a pdf file with your solutions to TUWEL by May 22, 2014.