

Logical Foundations of CS – CS5303

Quiz 2 15 points / 15 minutes

Important note: Please make sure that you justify your answers, and that your answers are readable. All non-justified answers will be graded half the points, all unreadable answers will be graded 0.

Exercise 1 (4 points) *Give an inductive definition of the propositions of propositional logic.*

Exercise 2 (2 points) *Using the truth tables, prove that:*

$$(a \vee b) \text{ is equivalent to } ((\neg a) \rightarrow b).$$

Exercise 3 (2 points) *What is the DNF form of 0 (false)? The expected answer does not contain 0.*

Exercise 4 (4 points) *Prove by induction that:*

$$\forall n \geq 2, \neg(a_1 \vee a_2 \vee \dots \vee a_n) \text{ is equivalent to } \neg a_1 \wedge \neg a_2 \wedge \dots \wedge \neg a_n.$$

Exercise 5 (1 points) *What is called the depth of a proposition?*