Quiz 9

Deadline	Wednesday, 23 October 2019 at 4:00PM
Latest Submission	*no submission yet*
Maximum Mark	5

Question 1 (1 mark)

True or false:

The following approach establishes that P(n) holds for all $n \in \mathbb{N}$:

- Show P(0) holds
- Show if P(n) holds for $n \geq 0$ then P(2n) holds
- Show if P(n) holds for $n \geq 0$ then P(n-1) holds

(a)	True
(b)	False

Question 2 (1 mark)

True or false:

The following approach establishes that P(n) holds for all $n \in \mathbb{N}$:

- Show P(0) holds
- Show P(1) holds
- Show that if P(a) holds and P(b) holds for $a,b \geq 0$ then P(a+b) holds

(a)	True
(b)	False

Question 3 (1 mark)

True or false:

The following establishes that P(w) holds for all $w \in \Sigma^*$

- Show P(a) holds for all $a \in \Sigma$
- Show if P(aw) holds then P(w) holds for all $a \in \Sigma$ and all $w \in \Sigma^*$
- Show if P(w) holds then P(abw) holds for all $a,b \in \Sigma$ and all $w \in \Sigma^*$

(a)	True

(b) ○	False

Question 4 (2 marks)

Recall the definition of a **well-formed formula** (over a set Prop):

- ⊤ is a well-formed formula
- ⊥ is a well-formed formula
- p is a well-formed formula for all p∈Prop
- If φ is a well-formed formula, then ¬φ is a well-formed formula
- If φ and ψ are well formed formulas, then:
  - φ∨ψ is a well-formed formula
  - φ∧ψ is a well-formed formula
  - φ→ψ is a well-formed formula
  - φ↔ψ is a well-formed formula

Fill in the blanks to complete the following statement (you may wish to use copy-paste to get the correct symbols):

In order to show that P(φ) holds for all well-formed formulas φ, we show:

- P(⊤) holds
- P(⊥) holds
- [Enter response] holds for all p∈P
- If P(φ) holds then P(¬φ) holds
- If [Enter response] and [Enter response] hold then:
  - P(φ∨ψ) holds
  - [Enter response] holds
  - [Enter response] holds, and
  - [Enter response] holds

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