ITRI626 - Klastoets 1 / Class test 1 – 7 Augustus / August 2019

**Vraag 1 / *Question 1***

Definieer die volgende terme: / *Define the following terms:*

1.1 Deduksie stelling / *Deduction theorem* [5]

*For any sentences* α *and* β (✔)*,* α ⊨ β (✔) *if and only if* (✔) *the sentence (α ⇒ β)* (✔) *is valid* (✔)*.*

1.2 Logiese gevolgtrekking in terme van geldigheid en bevredigbaarheid / *Logical entailment in terms of validity and satisfiability.* [5]

*For any sentences* α *and* β (✔)*,* α ⊨ β (✔) *if and only if* (✔) *the sentence (α ⋀ ¬β)* (✔) *is unsatisfiable* (✔)*.*

**Vraag 2 / *Question 2***

Deur van ‘n standaard waarheidstabel gebruik te maak bepaal of / *By using a standard truth table determine if*

R ⋀ ((Q ⇒ R) ⇒ P) ⊨ (P ⋁ Q ⋁ R)

Toon al jou stappe en redenasies aan. / *Show all your steps and reasoning.* [10]

*For any sentences* α *and* β*,* α ⊨ β *if and only if* *the sentence (α ⋀ ¬β)* *is unsatisfiable (*✔)*.*

Let α be R ⋀ ((Q ⇒ R) ⇒ P) and β be (P ⋁ Q ⋁ R).



Each column counts ✔ mark ∴ ✔ x 8

*Since (α ⋀ ¬β) is unsatisfiable, we can conclude that a ⊨ β and R ⋀ ((Q ⇒ R) ⇒ P) ⊨ (P ⋁ Q ⋁ R)* ✔

Totaal [20] / *Total [20]*