

Name: _____

ID#: _____

**PHILOSOPHY 279 Lec 03
Winter 2015**

TEST #2

Friday, March 20, 2015

1. Indicate which of the following are true and which are false.

(6 marks)

(i) True False All satisfiable sentences are logically equivalent.

(ii) True False No two unsatisfiable sentences are logically equivalent.

(iii) True False All invalid sentences are logically equivalent.

(iv) True False All valid sentences are logically equivalent.

(v) True False All valid arguments have valid conclusions.

(vi) True False Only invalid arguments have invalid conclusions.

2. For each of the sentences on the next page in List A find its correct symbolization from List B, given the following dictionary:

(10 marks)

T^1 : –is a triangle; F^1 : –is a figure; L^1 : –is large; S^1 : –is a circle

List A:

- (A₁) Every triangle is a figure.
 (A₂) Some figures are not triangles.
 (A₃) Some large figures are triangles.
 (A₄) Some large figures are not triangles.
 (A₅) Every figure is either a triangle or a circle.
 (A₆) If all figures are triangles, then there are no circles.
 (A₇) No circle is a triangle.
 (A₈) If any circle is large, then some circle is large.
 (A₉) If some circle is large, then any circle is large.
 (A₁₀) Only triangles are large.

List B:

- (B₁) $\exists x(Tx \wedge Fx)$
 (B₂) $\forall x(Tx \rightarrow Fx)$
 (B₃) $\forall x(Lx \rightarrow Tx)$
 (B₄) $\neg \exists x(Sx \wedge Tx)$
 (B₅) $\neg \exists x(Sx \rightarrow Tx)$
 (B₆) $\exists x(Lx \wedge Fx \wedge \neg Tx)$
 (B₇) $(\forall x(Fx \rightarrow Tx) \rightarrow \neg \exists xSx)$
 (B₈) $(\forall x(Fx \wedge Tx) \rightarrow \neg \exists xSx)$
 (B₉) $\exists x(Lx \wedge Fx \wedge Tx)$
 (B₁₀) $(\exists x(Sx \wedge Lx) \rightarrow \exists x(Sx \wedge Lx))$
 (B₁₁) $(\exists x(Sx \wedge Lx) \rightarrow \forall x(Sx \rightarrow Lx))$
 (B₁₂) $(\exists x(Sx \wedge Lx) \rightarrow \forall x(Lx \rightarrow Sx))$
 (B₁₃) $\forall x(Fx \rightarrow (Tx \vee Sx))$
 (B₁₄) $\forall x((Tx \vee Sx) \rightarrow Fx)$
 (B₁₅) $\exists x(Fx \wedge \neg Tx)$

Answer:

A ₁	
A ₂	
A ₃	
A ₄	
A ₅	
A ₆	
A ₇	
A ₈	
A ₉	
A ₁₀	

3. For each of the following sentences specify an interpretation in which it is true, and another interpretation in which it is false.

(10 marks)

(i) $\exists x(Fx \wedge Gx)$

True:

Domain: $\{1, 2\}$

Ext. of F^1 :

Ext. of G^1 :

False:

Domain: $\{1, 2\}$

Ext. of F^1 :

Ext. of G^1 :

(ii) $\exists x(Fx \vee Gx)$

True:

Domain: $\{1, 2\}$

Ext. of F^1 :

Ext. of G^1 :

False:

Domain: $\{1, 2\}$

Ext. of F^1 :

Ext. of G^1 :

(iii) $\forall x(Fx \rightarrow Gx)$

True:

Domain: $\{1, 2\}$

Ext. of F^1 :

Ext. of G^1 :

False:

Domain: $\{1, 2\}$

Ext. of F^1 :

Ext. of G^1 :

(iv) $\forall x \exists y Lxy$

True:

Domain: $\{1, 2\}$

Ext. of L^2 :

False:

Domain: $\{1, 2\}$

Ext. of L^2 :

(v) $\exists y \forall x Lxy$

True:

Domain: $\{1, 2\}$

Ext. of L^2 :

False:

Domain: $\{1, 2\}$

Ext. of L^2 :

4. Using the tree method test the following argument for validity. Identify a counterexample from an open path of a finished tree, if there is one. (4 marks)

$$\frac{(\exists x Lxa \rightarrow P)}{\exists x(Lxa \rightarrow P)}$$

Answer: