

Philosophy 240, Kenny Easwaran

Sample Final 1

December, 2017

Name: _____

Section: _____

1. Validity. Make up an argument with the described premises and conclusion, or say why such an argument is impossible. (5 pts each)

(a) Invalid, with two true premises, and a false conclusion.

(b) Valid, with one true premise (the only premise), and a false conclusion.

(c) Valid, with one true premise, one false premise, and a true conclusion.

2. Translations

- (a) Translate the following sentences from English into the formal language of Tarski's World. (5 points each)

i. b is the same size as a if a is a cube.

ii. b is not a large tetrahedron.

iii. Either c is larger than a , or d is.

(b) Give ordinary English translations of the following sentences in the formal language of Tarski's World. (5 points each)

i. $\text{Dodec}(b) \rightarrow \neg \text{Dodec}(a)$

ii. $\text{Larger}(a, b) \vee \text{Larger}(c, b)$

iii. $(\text{Cube}(b) \wedge \text{Small}(b)) \wedge (\text{Tet}(c) \wedge \text{Small}(c))$

(c) Translate the following sentences from English into the formal language of Tarski's World. (5 points each)

i. There is a small thing that is not to the left of a .

ii. If there is a large cube, then there is a small tetrahedron.

iii. Every tetrahedron adjoins a cube.

(d) Give ordinary English translations of the following sentences in the formal language of Tarski's World. (5 points each)

i. $\forall z (\text{Tet}(z) \rightarrow \neg \text{Small}(z))$

ii. $\forall z (\text{Cube}(z) \rightarrow \text{LeftOf}(z, a)) \wedge \exists y (\text{Tet}(y) \wedge \text{RightOf}(y, a))$

iii. $\exists y (\text{SameRow}(y, a) \wedge \exists x (\text{Tet}(x) \wedge \text{SameSize}(x, y)))$

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3. Assessing arguments

- (a) Construct a truth table for this argument and use it to state whether the argument is tautologically valid. (15 points)

$B \rightarrow \neg C$. $A \vee C$. Therefore, $A \vee B$.

- (b) Fill in the rules and line numbers for this formal proof. (15 points)

1	$C \vee \neg B$	_____
2	$C \rightarrow A$	_____
3	B	_____
4	C	_____
5	A	_____
6	$\neg B$	_____
7	$\perp$	_____
8	A	_____
9	A	_____
10	$B \rightarrow A$	_____

- (c) Say whether or not this argument is valid. If it is valid, explain why, and if it is not valid, show this by describing a counterexample. (15 points)

$\exists y(\text{Cube}(y) \wedge \neg \text{Large}(y)). \text{Large}(a). \text{Therefore, } \neg \text{Cube}(a).$

- (d) Say whether or not this argument is valid. If it is valid, explain why, and if it is not valid, show this by describing a counterexample. (15 points)

$\forall z(\text{Dodec}(z) \rightarrow \text{Large}(z)). \text{Tet}(a). \text{Therefore, } \exists x \neg \text{Large}(x).$

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- (e) Devon picked up a coin at the magic shop. He wants to know if it is a fair coin, or one of the special biased coins at the shop, so he flips it. 80% of the coins are fair and 20% are biased. He knows that a fair coin would have a 50% chance of coming up heads, and a biased coin would have an 80% chance of coming up heads. What is the probability that the coin is fair given that the coin came up tails? How strong is this evidence as an argument that the coin is fair? (15 points)