

### Phi 270 F96 test 1

1. Define equivalence by completing the following:  $\varphi \Leftrightarrow \psi$  if and only if ... . (Your answer need not replicate the wording of the text's definitions, but it should define equivalence in terms of truth values and possible worlds.)

answer

2. Suppose you know that  $\varphi, \psi \Rightarrow \chi$  and that  $\theta \Rightarrow \psi$ . Can you conclude that  $\varphi, \theta \Rightarrow \chi$ ? Explain why or why not by considering possibilities of truth and falsity.

answer

3. Give an example of a case of implicature that is not a case of implication, referring to definitions of implication and implicature to explain why your example is a case of one but not the other.

answer

4. Analyze the sentence below in as much detail as possible, presenting the result in both symbolic and English notation. Be sure that the unanalyzed components of your answer are complete and independent sentences; also try to respect any grouping in the English.

Although Mikita and Stapleton assisted him, Hull scored the goal

answer

5. Use the basic system of derivations (i.e., no replacement rules) to establish the following:

$$A, C \wedge D \Rightarrow C \wedge (A \wedge D)$$

answer

6. Use the basic system of derivations (i.e., no replacement rules) to show that the entailment below fails (as a generalization); give an extensional interpretation (i.e., an assignment of truth values) which makes its premises true and conclusion false:

$$(D \wedge C) \wedge B \Rightarrow A \wedge C$$

answer

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### Phi 270 F96 test 1 answers

1.  $\varphi \Leftrightarrow \psi$  if and only if there is no possible world in which  $\varphi$  and  $\psi$  differ in their truth values.
2. Yes. In any possible world in which  $\varphi$  and  $\theta$  are true,  $\psi$  will be true (since  $\theta \Rightarrow \psi$ ), so  $\chi$  will be true (since  $\varphi, \psi \Rightarrow \chi$ ). So there can be no world in which  $\varphi$  and  $\theta$  are true while  $\chi$  is false.
3. For example: **A car is in my driveway** implicates but does not imply **A car other than mine is in my driveway**; for, while it would

in general be inappropriate to say *A car is in my driveway* (rather than say, for example, *My car is in the driveway*) if the car is mine, it would not be false when the driveway contained only my car.

4. Although Mikita and Stapleton assisted him, Hull scored the goal

Mikita and Stapleton assisted Hull  $\wedge$  Hull scored the goal  
 (Mikita assisted Hull  $\wedge$  Stapleton assisted Hull)  $\wedge$  Hull scored the goal

$$(M \wedge S) \wedge H$$

both both M and S and H

H: Hull scored the goal; M: Mikita assisted Hull ; S: Stapleton assisted Hull

5.

	A	(5)
	C $\wedge$ D	1
	C	(3)
1	D	(6)
1		
3 QED	C	2
5 QED	•	
5 QED	A	4
6 QED	•	
6 QED	D	4
4 Cnj	A $\wedge$ D	2
2 Cnj	C $\wedge$ (A $\wedge$ D)	

6.

	$(D \wedge C) \wedge B$	1
1 Ext	$D \wedge C$	2
1 Ext	$B$	
2 Ext	$D$	
2 Ext	$C$	(4)
	$\circ$	$B, C, D \Rightarrow A$
	$A$	3
	$\bullet$	
4 QED	$C$	3
3 Cnj	$A \wedge C$	
$A \ B \ C \ D$	$(D \wedge C) \wedge B / A \wedge C$	
$F \ T \ T \ T$	$T \quad \textcircled{T} \quad \textcircled{F}$	