

### Phi 270 F97 quiz 1 (of 6)

1. Define (a special case of) entailment by completing the following:  $\phi, \psi \Rightarrow \chi$  if and only if ... . (Your answer need not replicate the wording of the text's definitions, but it should define entailment in terms of truth values and possible worlds.)

[ answer ]

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

[ answer ]

3. Provide an example of a true sentence that has a false implicature. (Be sure to state both the sentence and its implicature and to explain why one is true and the other false and also why one implicates 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.

*Ann and Bill helped to plan the campaign, but Carol directed it and reported its results*

[ answer ]

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

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

[ answer ]

6. Use the basic system of derivations (i.e., no replacement rules) to show that the entailment below fails; provide a table in which you calculate the truth values of the premises and conclusion on an extensional interpretation (i.e., an assignment of truth values) which makes the premises true and conclusion false:

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

[ answer ]

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### Phi 270 F97 quiz 1 answers

1.  $\phi, \psi \Rightarrow \chi$  if and only if there is no possible world in which  $\chi$  is false while  $\phi$  and  $\psi$  are both true.
2. Yes. In any possible world, each of  $\phi$  and  $\chi$  must have the same truth value as  $\psi$ , so they must have the same truth value as each other.
3. *I pushed the button but the motor shut off* is true even if the button is an emergency shutoff button for the motor, but it implicates (at least) *The button did not shut off the motor*, which is false in this case. The implicature arises because the word *but* is not appropriate

in cases where the clause it introduces describes an expected result of the truth of the other clause.

4. *Ann and Bill helped to plan the campaign, but Carol directed it and reported its results*

*Ann and Bill helped to plan the campaign*  $\wedge$  *Carol directed the campaign and reported its results*

(*Ann helped to plan the campaign*  $\wedge$  *Bill helped to plan the campaign*)  $\wedge$  (*Carol directed the campaign*  $\wedge$  *Carol reported the campaign's results*)

$$(A \wedge B) \wedge (D \wedge R)$$

both both A and B and both D and R

[A: *Ann helped to plan the campaign*; B: *Bill helped to plan the campaign*; D: *Carol directed the campaign*; R: *Carol reported the campaign's results*]

5.

	A $\wedge$ B	1
	C $\wedge$ D	2
1 Ext	A	(5)
1 Ext	B	(7)
2 Ext	C	(6)
2 Ext	D	
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5 QED	A	4
	<div style="border-left: 1px solid black; padding-left: 5px; margin-left: 10px;"> <div style="border-left: 1px solid black; padding-left: 5px; margin-left: 10px;">•</div> </div>	
6 QED	C	4
4 Cnj	A $\wedge$ C	3
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7 QED	B	3
3 Cnj	(A $\wedge$ C) $\wedge$ B	

6.

	$(A \wedge B) \wedge C$	1
1 Ext	$A \wedge B$	2
1 Ext	C	(6)
2 Ext	A	(5)
2 Ext	B	
	•	
5 QED	A	3
	○	A, B, C $\Rightarrow$ D
	D	4
	•	
6 QED	C	4
4 Cnj	D $\wedge$ C	3
3 Cnj	A $\wedge$ (D $\wedge$ C)	
$A \ B \ C \ D$	$(A \wedge B) \wedge C / A \wedge (D \wedge C)$	
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