

**Phi 270 F98 quiz 1 (of 6)** in pdf format

1. Define entailment by completing the following:  $\Gamma \Rightarrow \phi$  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. Remember that  $\Gamma$  is a set, not a sentence, so it does not itself have a truth-value.)  
[ answer ]
2. Suppose you know that  $\Rightarrow \phi$  (i.e.,  $\phi$  is a tautology) and that  $\phi \Rightarrow \psi$ . Can you conclude that  $\phi \Leftrightarrow \psi$ ? Explain why or why not by considering possibilities of truth and falsity.  
[ answer ]
3. Explain how a sentence can implicate something it doesn't imply. (While you don't need to state the definitions of implication and implicature, you will need to employ the ideas used in them.)  
[ 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 Carol called Dave, she didn't reach him; but Ed stopped by and helped her finish the job.*  
[ answer ]
5. Use the basic system of derivations (i.e., no replacement rules) to check whether the entailment below holds. If it 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.  
$$A \wedge (B \wedge C), B \wedge D \Rightarrow (C \wedge D) \wedge E$$
  
[ answer ]
6. [This question was on a topic not covered in Fo4] Use replacement principles to put the following sentence into list normal form (in which no conjunction is the left component of a conjunction and letters appear in alphabetical order without repetition):  
$$(B \wedge C) \wedge (A \wedge B)$$
  
[ answer ]

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**Phi 270 F98 quiz 1 answers**

1.  $\Gamma \Rightarrow \phi$  if and only if there is no possible world in which  $\phi$  is false while every member of  $\Gamma$  is true.
2. Yes. In every possible world,  $\phi$  is true (because it is a tautology) so  $\psi$  is true too (since  $\phi \Rightarrow \psi$ ), so there is no possible world in which  $\phi$  and  $\psi$  have different truth values.
3. Since a true sentence can still be inappropriate for other reasons, something can be required for a sentence to be appropriate (and

thus be implicated by it) without being required for its truth (and thus without being implied by it).

4. *Although Carol called Dave, she didn't reach him; but Ed stopped by and helped her finish the job*

*Although Carol called Dave, she didn't reach him*  $\wedge$  *Ed stopped by and helped Carol finish the job*

*(Carol called Dave*  $\wedge$  *Carol didn't reach Dave)*  $\wedge$  *(Ed stopped by*  $\wedge$  *Ed helped Carol finish the job)*

$$(C \wedge D) \wedge (E \wedge F)$$

both both C and D and both E and F

[C: *Carol called Dave*; D: *Carol didn't reach Dave*; E: *Ed stopped by*; F: *Ed helped Carol finish the job*]

5.

	$A \wedge (B \wedge C)$	1
	$B \wedge D$	2
1 Ext	A	
1 Ext	$B \wedge C$	3
2 Ext	B	
2 Ext	D	(7)
3 Ext	B	
3 Ext	C	(6)
		•
6 QED	C	5
		•
7 QED	D	5
5 Cnj	$C \wedge D$	4
		○
	E	4
4 Cnj	$(C \wedge D) \wedge E$	

A	B	C	D	E	$A \wedge (B \wedge C), B \wedge D / (C \wedge D) \wedge E$
T	T	T	T	F	(T) T (T) T (F)

6. [This question was on a topic not covered in Fo4]

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

$\Leftrightarrow$

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

$\Leftrightarrow$

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

$\Leftrightarrow$

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

$\Leftrightarrow$

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