Phi 270 F04 test 1 in pdf format

1. Define inconsistency by completing the following: Γ is inconsistent (i.e., $\Gamma \Rightarrow$) if and only if ... . (Your answer need not replicate the wording of the text's definitions, but it should define inconsistency in terms of the ideas of truth values and possible worlds. Remember that Γ is a set, not a sentence, so it does not have a truth value; but any members of it are sentences and have truth values.)
[answer]

2. 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 the ideas of truth values and possible worlds.)
[answer]

3. Suppose you know that (i) $\varphi \Rightarrow \psi$ (i.e., φ entails ψ), (ii) $\psi \Rightarrow \chi$ (i.e., ψ entails χ), and (iii) ψ is true (in the actual world). What, if anything, can you conclude about the truth values of φ and χ (in the actual world)? Be sure to say what can be known about each of φ and χ and be sure to explain your answers in terms of the definition of entailment.
[answer]

4. Suppose that φ implies ψ and also that φ implicates χ. Which of the following patterns of truth values are ruled out and which are permitted by the cited relations among the three sentences? Explain your answer using the definitions of implication and implicature.

	φ	ψ	χ
(a)	T	T	F
(b)	T	F	T
(c)	T	F	F

[answer]

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

5. *Ed tried the door, but it was locked; however, the window was open, and he climbed through it*
[answer]

Use derivations to check whether each of the claims of entailment below holds. If an entailment fails, present a counterexample by providing 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) that divides an open gap. *Do not use the rule Adj in the first derivation, but you may use it in the second.*

6. $A \wedge C, B \wedge D \Rightarrow B \wedge (C \wedge D)$
[answer]

7. $A \wedge (B \wedge C) \Rightarrow (A \wedge B) \wedge (C \wedge D)$
[answer]

Phi 270 F04 test 1 answers

1. Γ is inconsistent (i.e., $\Gamma \Rightarrow$) if and only if there is no possible world in which all members of Γ are true. (Or: ... if and only if, in each possible world, at least one member of Γ is false.)

2. $\varphi \Leftrightarrow \psi$ if and only if there is no possible world in which φ and ψ have different truth values. (Or: ... if and only if, in each possible world, φ has the same truth value as ψ.)

3. You know that χ is true because you know that ψ is true and also that χ must be true in every possible world in which ψ is true (because $\psi \Rightarrow \chi$). However, you know nothing about the truth value of φ because, while you know that ψ is true if φ is (because $\varphi \Rightarrow \psi$), it may be that ψ is true also in some cases in which φ is false.

4. Patterns (b) and (c) are ruled out but (a) is not. Since φ implies ψ, it cannot be true when ψ is false; that rules out (b) and (c) but not (a). And, while a sentence with a false implicature is inappropriate and misleading, it may be true; therefore, the fact that φ implicates χ rules out no pattern of truth values for the two.

5. *Ed tried the door, but it was locked; however, the window was open, and he climbed through it*
Ed tried the door, but it was locked ∧ the window was open, and Ed climbed through it
(Ed tried the door ∧ the door was locked) ∧ (the window was open ∧ Ed climbed through the window)

(T ∧ L) ∧ (O ∧ C)

both both T and L and both O and C

[C: E*d climbed through the window*; L: *the door was locked*; O: *the window was open*; T: *Ed tried the door*]

6.

	A ∧ C	1
	B ∧ D	2
	———	
1 Ext	A	
1 Ext	C	(6)
2 Ext	B	(5)
2 Ext	D	(7)
	•	
	———	
5 QED	B	3
	•	
	———	
6 QED	C	4
	•	
	———	
7 QED	D	4
	———	
4 Cnj	C ∧ D	3
	———	
3 Cnj	B ∧ (C ∧ D)	

7.

	$A \wedge (B \wedge C)$	1
1 Ext	A	(5)
1 Ext	$B \wedge C$	2
2 Ext	B	(6)
2 Ext	C	(8)
	•	
5 QED	A	4
	•	
6 QED	B	4
4 Cnj	$A \wedge B$	3
	•	
8 QED	C	7
	○	A, B, C $\Rightarrow$ D
	D	7
7 Cnj	$C \wedge D$	3
3 Cnj	$(A \wedge B) \wedge (C \wedge D)$	

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