

Phi 270 F97 test 3

(questions 1-6 are from quiz 3 and 7-9 are from quiz 4 out of 6 quizzes—these two quizzes addressed the part of the course your test is designed to cover)

Analyze the sentences below in as much detail as possible *without* going below the level of sentences (i.e., without recognizing individual terms and predicates). Be sure that the unanalyzed components of your answer are complete and independent sentences and that you respect any grouping in the English.

1. The creek will be high enough only if it rains.

answer

2. Unless you object, Al will show the letter to Barb if she asks to see it.

answer

Check each of the following for validity using the basic system of derivations (i.e., *do not use* attachment rules but *you may use* detachment rules). If a derivation fails, present a counterexample that divides its premises from its conclusion.

3. $A \rightarrow (B \vee C)$

$\neg C \rightarrow (A \rightarrow B)$

answer

4. $A \rightarrow (B \rightarrow C)$

$(C \wedge A) \rightarrow B$

answer

5. Analyze the sentence below in as much detail as possible, continuing the analysis when there are no more connectives by identifying predicates, functors, and individual terms. Be sure that the unanalyzed expressions in your answer are independent and that you respect any grouping in the English.

If Dan's wife received the message, she is the person who called.

answer

6. a. Give two different expansions (using predicate abstracts) of the sentence: Raba.

answer

- b. Put the following into reduced form: $[Pxa \wedge Qbx]_x a$.

answer

7. Describe a structure (i.e., an assignment of extensions to the non-logical vocabulary) which makes the following sentences all true. (You may present the structure either using tables or, where possible, using diagrams.)

$$a = fb, fa = fb, b = c, Fa, \neg F(gc), Rb(fa), \neg Ra(fb), R(gc)c$$

answer

Use derivations to check each of the claims of entailment below. You need *not* present counterexamples to dead-end gaps.

8. $Fa \wedge \neg Fb \Rightarrow b = c \rightarrow \neg a = c$

answer

9. $fa = c, fb = c, Rc(fa) \rightarrow Ra(fa) \Rightarrow R(fa)(fb) \rightarrow Rb(fb)$

answer

Phi 270 F97 test 3 answers

1. the creek will be high enough only if it rains
 \neg the creek will be high enough \leftarrow \neg it will rain
 $\neg H \leftarrow \neg R$ **or** $\neg R \rightarrow \neg H$

if not R then not H

H: the creek will be high enough; R: it will rain

2. \neg you will object \rightarrow Al will show the letter to Barb if she asks to see it
 \neg you will object \rightarrow (Al will show the letter to Barb \leftarrow Barb will ask to see the letter)

$$\neg O \rightarrow (S \leftarrow A) \text{ or } \neg O \rightarrow (A \rightarrow S)$$

if not O then if A then S

A: Barb will ask to see the letter; O: you will object; S: Al will show the letter to Barb

3.

A \rightarrow (B \vee C)	3
\neg C	(4)
A	(3)
3 MPP B \vee C	4
4 MTP B	(5)
•	
5 QED B	2
2 CP A \rightarrow B	1
1 CP \neg C \rightarrow (A \rightarrow B)	

4.	$A \rightarrow (B \rightarrow C)$	3
	$C \wedge A$	2
2 Ext	C	
2 Ext	A	(3)
3 MPP	$B \rightarrow C$	5
	$\neg B$	
	$\neg B$	
	\circ	$A, \neg B, C \neq \perp$
	\perp	6
6 IP	B	5
	C	
	\circ	$A, \neg B, C \neq \perp$
	\perp	5
5 RC	\perp	4
4 IP	B	1
1 CP	$(C \wedge A) \rightarrow B$	

A	B	C	$A \rightarrow (B \rightarrow C) / (C \wedge A) \rightarrow B$
T	F	T	Ⓣ T T ⓕ

5. Dan's wife received the message \rightarrow Dan's wife is the person who called

[_ received _] Dan's wife the message \rightarrow Dan's wife = the person who called

$R(\text{Dan's wife})m \rightarrow [_ 's \text{ wife}] \text{ Dan} = p$

$R(fd)m \rightarrow fd = p$

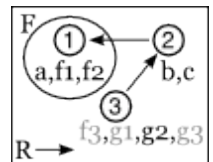
R: [_ received _]; d: Dan; f: [_ 's wife]; m: the message; p: the person who called

6. a. The following are the possibilities; in the last, τ may be any term:

$[Rxbx]_x a, [Rxba]_x a, [Rabx]_x a, [Raxa]_x b, [Raba]_x \tau$

b. $Paa \wedge Qba$

7.	range: 1, 2, 3	$a \ b \ c$	$\tau \ \ f\tau$	$\tau \ \ g\tau$	$\tau \ \ F\tau$	$R \ $	1	2	3
		1 2 2	1 1	1 3	1 T	1	F	F	F
			2 1	2 3	2 F	2	T	F	F
			3 3	3 3	3 F	3	T	T	F



(The diagram provides a complete answer, and so do the tables to its left. The tables below show a way of arriving at these answers.)

alias sets IDs values

a	1	a: 1
fa		f1: 1
fb		f2: 1
<hr/>		
b	2	b: 2
c		c: 2
<hr/>		
gc	3	g2: 3

resources values

Fa	F1: T
$\neg F(gc)$	F3: F
Rb(fa)	R21: T
$\neg Ra(fb)$	R11: F
R(gc)c	R32: T

8.

	$Fa \wedge \neg Fb$	1
1 Ext	Fa	(4)
1 Ext	$\neg Fb$	(4)
	$b = c$	a,b-c
	$a = c$	a-b-c
	•	
4 Nc=	\perp	3
3 RAA	$\neg a = c$	2
2 CP	$b = c \rightarrow \neg a = c$	

9.

	$fa = c$	
	$fb = c$	a,b,c-fa-fb
	$Rc(fa) \rightarrow Ra(fa)$	3
	$R(fa)(fb)$	(4)
	$\neg Rb(fb)$	
	•	
4 QED=	$Rc(fa)$	3
	$Ra(fa)$	
	○	$fa=c,fb=c,R(fa)(fb),\neg Rb(fb),Ra(fa) \Rightarrow \perp$
	\perp	3
3 RC	\perp	2
2 IP	$Rb(fb)$	1
1 CP	$R(fa)(fb) \rightarrow Rb(fb)$	