

## Phi 270 F96 part of quiz 4 and all of quiz 5 (of 6)

(questions from these two tests addressed the part of the course your test is designed to cover)

- 4-4.** Identify individual terms and quantifier phrases in the following sentence and indicate links between pronouns and their antecedents. (You can do this by marking up an English sentence; you are *not* being asked to provide a symbolic analysis.)

*Al called everyone who left him a message concerning the accident and told them he had seen it.*

[ answer ]

Analyze the following generalizations in as much detail as possible. Provide a key to the non-logical vocabulary (upper and lower case letters) appearing in your answer *and restate the result using an unrestricted quantifier.*

- 4-5.** *Every employee received the letter.*

[ answer ]

- 4-6.** *Among bystanders, Sam interviewed only soldiers.*

[ answer ]

Analyze the following sentences in as much detail as possible, providing a key to the non-logical vocabulary (upper and lower case letters) appearing in your answer.

- 5-1.** *If anyone guessed the number, the prize was awarded.*

[ answer ]

- 5-2.** *Everyone who worked on any part of the project was honored.*

[ answer ]

Synthesize an English sentence whose analysis would yield the following form.

- 5-3.**  $(\forall x: Px) \rightarrow \forall y Axy$

[A:  $\lambda xy (x \text{ ate } y)$ ; P:  $\lambda x (x \text{ is a person})$ ]

[ answer ]

Use derivations to establish the validity of the following arguments. You may use attachment rules.

- 5-4.**  $\forall x Fx$

$\forall x Gx$

$\forall x (Fx \wedge Gx)$

[ answer ]

- 5-5.**  $(\forall x: Fx) Rxa$

$(\forall x: Rxa) \forall y Ryx$

$\forall x (\forall y: Fy) Rxy$

[ answer ]

- 5-6.** Use a derivation to show that the following argument is not valid and describe a structure dividing one of the derivation's open gaps. (You will *not* need the rules UG+, RUG+, and ST introduced in §7.8 that are designed to avoid unending gaps.)

$\forall x Rxx$

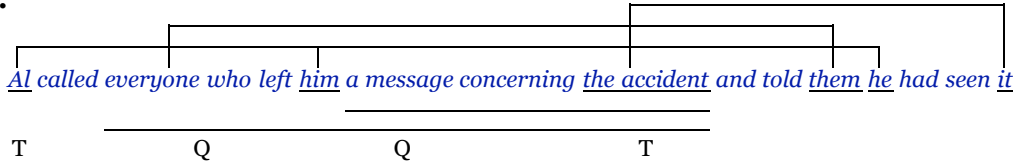
$Rab \rightarrow \forall x Rxa$

[ answer ]

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**Phi 270 F96 Answers to part of quiz 4 and all of quiz 5**

4-4.



[it could instead have *a message concerning the accident* as its antecedent]

4-5. *Every employee received the letter*

*Every employee is such that (he or she received the letter)*

( $\forall x$ : *x is an employee*) *x received the letter*

$$(\forall x: Ex) Rxl$$

$$\forall x (Ex \rightarrow Rxl)$$

[E:  $\lambda x$  (*x is an employee*); R:  $\lambda xy$  (*x received y*); l: *the letter*]

4-6. *Among bystanders, Sam interviewed only soldiers*

*Among bystanders, only soldiers are such that (Sam interviewed them)*

( $\forall x$ : *x was a bystander*  $\wedge$   $\neg$  *x was a soldier*)  $\neg$  Sam interviewed x

$$(\forall x: Bx \wedge \neg Sx) \neg Isx$$

$$\forall x ((Bx \wedge \neg Sx) \rightarrow \neg Isx)$$

[B:  $\lambda x$  (*x was a bystander*); I:  $\lambda xy$  (*x interviewed y*); S:  $\lambda x$  (*x was a soldier*); s: *Sam*]

5-1. *If anyone guessed the number, the prize was awarded*

*Everyone is such that (if he or she guessed the number, the prize was awarded)*

( $\forall x$ : *x is a person*) (if *x guessed the number*, *the prize was awarded*)

( $\forall x$ : Px) (*x guessed the number*  $\rightarrow$  *the prize was awarded*)

$$(\forall x: Px) (Gxn \rightarrow Ap)$$

[P:  $\lambda x$  (*x is a person*); G:  $\lambda xy$  (*x guessed y*); n: *the number*]

5-2. *Everyone who worked on any part of the project was honored*

*Every part of the project is such that (everyone who worked on it was honored)*

( $\forall x$ : *x is a part of the project*) *everyone who worked on x was honored*

( $\forall x$ : Rxj) ( $\forall y$ : *y is a person who worked on x*) *y was honored*

( $\forall x$ : Rxj) ( $\forall y$ : *y is a person*  $\wedge$  *y worked on x*) Hy

$$(\forall x: Rxj) (\forall y: Py \wedge Wyx) Hy$$

[H:  $\lambda x$  (*x was honored*); P:  $\lambda x$  (*x is a person*); R:  $\lambda xy$  (*x is a part of y*); W:  $\lambda xy$  (*x worked on y*); j: *the project*]

5-3. ( $\forall x$ : *x is a person*)  $\neg$   $\forall y$  *x ate y*

( $\forall x$ : *x is a person*)  $\neg$  *x ate everything*

*No one is such that (he or she ate everything)*

*No one ate everything*

<b>5-4.</b>	$\forall x Fx$	a:2
	$\forall x Gx$	a:3
	(a)	
2 UI	Fa	(5)
3 UI	Ga	(6)
	•	
5 QED	Fa	4
	•	
6 QED	Ga	4
4 Cnj	Fa $\wedge$ Ga	1
1 UG	$\forall x (Fx \wedge Gx)$	1

<b>5-5.</b>	$(\forall x: Fx) Rxa$	c:3
	$(\forall x: Rxa) \forall y Ryx$	c:4
	(b)	
	(c)	
	Fc	(3)
3 SB	Rca	(4)
4 SB	$\forall y Ryc$	b:5
5 UI	Rbc	(6)
	•	
6 QED	Rbc	2
2 RUG	$(\forall y: Fy) Rby$	1
1 UG	$\forall x (\forall y: Fy) Rxy$	

<b>5-6.</b>	$\forall x Rxx$	a:1,b:2,c:5
1 UI	Raa	
2 UI	Rbb	
	Rab	
	(c)	
5 UI	Rcc	
	$\neg Rca$	
	$\circ$	Raa,Rab,Rbb,Rcc, $\neg Rca \Rightarrow \perp$
	$\perp$	6
6 IP	Rca	4
4 UG	$\forall x Rxa$	3
3 CP	$Rab \rightarrow \forall x Rxa$	

