Quiz #5

PHIL-205-01: Symbolic Logic

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1 Section I

Using the following symbolization key to connect the sentences in english to the sentences in FOL:
domain: people
Hx: x testified before the House Select Committee to investigate the January 6th Attack.
Px: x is President of the United States.
Sx: x is a septuagenarian.

1. C.At least two people have testified before the House Select Committee.
2. I.Exactly two people have testified before the House Select Committee.
3. B.Somebody has testified before the House Select Committee.
4. E.At most two people have testified before the House Select Committee.
5. H.Everyone has testified before the House Select Committee.
6. D.The President of the United States is a septuagenarian.

(A) $\forall x \forall y (Hx \wedge Hy \wedge \forall z (x = y \vee x = z \vee y = z))$

(B) $\exists x Hx$

(C) $\exists x \exists y (Hx \wedge Hy \wedge \neg x = y)$

(D) $\forall x (Px \implies Sx)$

(E) $\forall x \forall y \forall z [(Hx \wedge Hy \wedge Hz) \implies (x = y \vee x = z \vee y = z)]$

(F) $\exists x (Px \wedge \forall y (Py \implies x = y) \wedge Sx)$

(G) $\exists x \exists y [Hx \wedge Hy \wedge \neg x = y \wedge \forall z (Hz \implies x = z \vee y = z)]$

(H) $\forall x Hx$

(I) $\exists x \exists y [(Hx \wedge Hy \wedge \neg x = y) \implies \forall z (Hz \implies [x = z \vee y = z])]$

2 Section 2

Use the following symbolization key to symbolize the sentences into FOL.
domain:people
Sx:x is a septuagenarian.
Gx:x attended a Grateful Dead concert in 1984.
Wx:x lives in the White House.

1. A septuagenarian who lives in the White House attended a Grateful Dead concert in 1984.

$$\forall x(Sx \implies (Gx \wedge Wx)) \tag{1}$$

2. The septuagenarian who lives in the White House attended a Grateful Dead concert in 1984.

$$\exists x(Sx \wedge Gx \wedge Wx) \tag{2}$$

3. There are at most two septuagenarians living in the White House.

$$\exists x \exists y \forall z[Sx \wedge Wx \wedge Sy \wedge Wy \wedge ([Sz \wedge Wz] \implies [x = z \vee y = z])] \tag{3}$$

4. There is exactly one septuagenarian living in the White House.

$$\exists x \forall y[(Sx \wedge Wx) \wedge \neg x = y] \tag{4}$$

5. The septuagenarian who lives in the White House is not the septuagenarian who attended a Grateful Dead concert in 1984.

$$\exists x \exists y(Sx \wedge Wx \wedge Sy \wedge Gy \wedge \neg x = y) \tag{5}$$