

# CS-171, Intro to A.I. — Quiz#3 — Fall Quarter, 2016 — 20 minutes

YOUR NAME AND EMAIL ADDRESS: Solutions

YOUR ID: \_\_\_\_\_

ROW: \_\_\_\_\_ SEAT: \_\_\_\_\_

1. (70 pts total, 10 pts each) For each English sentence below, write the letter corresponding to its best or closest FOPC (FOL) sentence (wff, or well-formed formula). The first one is done for you, as an example.

1.a (example) D “Everybody likes somebody.”

- A.  $\forall x \forall y \text{ Person}(x) \wedge \text{Person}(y) \wedge \text{Likes}(x, y)$
- B.  $\forall x \exists y \text{ Person}(x) \wedge \text{Person}(y) \wedge \text{Likes}(x, y)$
- C.  $\forall x \forall y \text{ Person}(x) \Rightarrow (\text{Person}(y) \wedge \text{Likes}(x, y))$
- D.  $\forall x \exists y \text{ Person}(x) \Rightarrow (\text{Person}(y) \wedge \text{Likes}(x, y))$

1.b (10 pts) \_\_\_\_\_ “All persons are mortal.”

- A.  $\forall x \text{ Person}(x) \wedge \text{Mortal}(x)$
- B.  $\forall x \text{ Person}(x) \Rightarrow \text{Mortal}(x)$
- C.  $\exists x \text{ Person}(x) \wedge \text{Mortal}(x)$
- D.  $\exists x \text{ Person}(x) \Rightarrow \text{Mortal}(x)$

1.c (10 pts) \_\_\_\_\_ “For every food, there is a person who eats that food.”

- A.  $\forall x \exists y \text{ Food}(x) \wedge \text{Person}(y) \wedge \text{Eats}(y, x)$
- B.  $\forall x \exists y [\text{Food}(x) \wedge \text{Person}(y)] \Rightarrow \text{Eats}(y, x)$
- C.  $\forall x \exists y \text{ Food}(x) \Rightarrow [\text{Person}(y) \wedge \text{Eats}(y, x)]$
- D.  $\forall x \forall y \text{ Food}(x) \wedge \text{Person}(y) \wedge \text{Eats}(y, x)$

1.d (10 pts) \_\_\_\_\_ “Every person eats every food.”

- A.  $\forall x \forall y [\text{Person}(x) \wedge \text{Food}(y)] \Rightarrow \text{Eats}(x, y)$
- B.  $\forall x \forall y \text{ Person}(x) \Rightarrow [\text{Food}(y) \wedge \text{Eats}(x, y)]$
- C.  $\forall x \forall y \text{ Person}(x) \wedge \text{Food}(y) \wedge \text{Eats}(x, y)$
- D.  $\forall x \exists y [\text{Person}(x) \wedge \text{Food}(y)] \Rightarrow \text{Eats}(x, y)$

1.e (10 pts) \_\_\_\_\_ “There is someone at UCI who is smart.”

- A.  $\forall x \text{ Person}(x) \wedge \text{At}(x, \text{UCI}) \wedge \text{Smart}(x)$
- B.  $\exists x \text{ Person}(x) \wedge \text{At}(x, \text{UCI}) \wedge \text{Smart}(x)$
- C.  $\forall x [\text{Person}(x) \wedge \text{At}(x, \text{UCI})] \Rightarrow \text{Smart}(x)$
- D.  $\exists x \text{ Person}(x) \Rightarrow [\text{At}(x, \text{UCI}) \wedge \text{Smart}(x)]$

1.f (10 pts) \_\_\_\_\_ “Everyone at UCI is smart.”

- A.  $\forall x \text{ Person}(x) \wedge \text{At}(x, \text{UCI}) \wedge \text{Smart}(x)$
- B.  $\exists x \text{ Person}(x) \wedge \text{At}(x, \text{UCI}) \wedge \text{Smart}(x)$
- C.  $\forall x [\text{Person}(x) \wedge \text{At}(x, \text{UCI})] \Rightarrow \text{Smart}(x)$
- D.  $\exists x \text{ Person}(x) \Rightarrow [\text{At}(x, \text{UCI})] \wedge \text{Smart}(x)$

1.g (10 pts) \_\_\_\_\_ “Every person eats some food.”

- A.  $\forall x \exists y [\text{Person}(x) \wedge \text{Food}(y)] \Rightarrow \text{Eats}(x, y)$
- B.  $\forall x \exists y \text{ Person}(x) \wedge \text{Food}(y) \wedge \text{Eats}(x, y)$
- C.  $\forall x \forall y \text{ Person}(x) \wedge \text{Food}(y) \wedge \text{Eats}(x, y)$
- D.  $\forall x \exists y \text{ Person}(x) \Rightarrow [\text{Food}(y) \wedge \text{Eats}(x, y)]$

1.h (10 pts) \_\_\_\_\_ “Some person eats some food.”

- A.  $\exists x \exists y \text{ Person}(x) \wedge \text{Food}(y) \wedge \text{Eats}(x, y)$
- B.  $\exists x \exists y [\text{Person}(x) \wedge \text{Food}(y)] \Rightarrow \text{Eats}(x, y)$
- C.  $\exists x \exists y \text{ Person}(x) \Rightarrow [\text{Food}(y) \wedge \text{Eats}(x, y)]$
- D.  $\forall x \forall y \text{ Person}(x) \wedge \text{Food}(y) \wedge \text{Eats}(x, y)$

\*\*\*\* TURN PAGE OVER. QUIZ CONTINUES ON THE REVERSE. \*\*\*\*

