

Practice Examination #2

Note: The real second examination will have the following format, but some sections of it may have a few more or a few less problems than the corresponding sections below. The problems in Part B of the real exam may be easier than those in Part B below, but you should be prepared for problems as difficult as those below. (The problems in the real exam will not be harder than those in Part B below.) I may allocate points somewhat differently.

Part A. Symbolization (50 points) Symbolize the following sentences using the interpretation given below. If the sentence is ambiguous, provide only one symbolization.

D: Students

A①②: ① annoys ②.

L①②: ① likes ②.

D①②: ① despises ②.

J①: ① is a junior.

S①: ① is a senior.

a: Alonzo

g: Gertrude

1. Alonzo likes Gertrude only if she likes him.
2. Alonzo likes all and only seniors.
3. Alonzo likes someone who despises every junior who likes Gertrude.
4. Alonzo likes a junior only if she does not annoy him.
5. No junior despises all seniors.
6. Every senior despises some junior.

Exam continues on the next page

Part B. Quantificational Relations (50 points) Provide interpretations in small finite domains that show that the following claims are correct. Indicate which sentences are true and which are false on the interpretations you provide. You will get some credit for correctly indicating which sentences must be true and which false to verify the claims given, even if you cannot provide a verifying interpretation.

11. The following set of sentences is quantificationally consistent:

$$\exists x(Ax \vee Bx), \quad \forall x(Bx \rightarrow Ax), \quad \sim \exists x(Ax \& Bx)$$

12. The following sentences are not quantificationally equivalent:

$$\forall x \exists y \exists z (Cyx \rightarrow Dxz), \quad \forall x \exists z \exists y (Cxz \rightarrow Dxy)$$

Hint: use the confinement equivalences (as much as you can) to find sentences equivalent to these before you try to find an interpretation in which one of these sentences is true and the other is false. **Note:** a hint like this will *not* appear on the real exam.

13. The following argument is not quantificationally valid:

$$\forall x \forall y (Fxy \rightarrow Gxa). \quad \sim \exists x (Fxx \vee Gxx). \quad \forall x \forall y (Fxy \rightarrow Fyx). \quad \therefore \sim \exists x \exists y Gxy$$

Hint: use the confinement equivalences (as much as you can) to find sentences equivalent to these before you try to find an interpretation on which all of the premises are true and the conclusion false. **Note:** a hint like this will *not* appear on the real exam.