

Philosophy 324A
Philosophy of Logic
2016
Note Twenty

THIS IS A HOMEWORK ASSIGNMENT: Please read the set-up information below and use it in answering the questions that follow. These aren't difficult questions, and you should be able to answer them correctly in no time flat. You might wonder what the point would be in having you answer such unchallenging questions. It's a good question and has a good answer. The first member of class to disclose my purpose in having you go through this exercise will be awarded the 2016 edition of Frege's Virtual Cigar. Send me your answers (and your guess) before class on Tuesday. Email is fine. Hardcopy is OK too.

SET-UP MATERIAL FOR ST

Intuitive set theory – a version of which appears in Frege's *Foundation of Arithmetic* of 1884 – has the following axiomatic provisions.

1. There exists a set \emptyset defined by the condition that it has no members.
2. All sets are defined by their members and nothing else.
3. If S is a set, there exists a set \bar{S} , the complement of S , whose members are all and only those things not members of S .
4. If S and S' are sets, there exists a set $S \cup S'$ whose members are all and only those things that are members of S or are members of S' or are members of each. $S \cup S'$ is called the union of S and S' .
5. If S and S' are sets there is a set $S \cap S'$, the intersection of S and S' , whose members are all and only those things that are members of both S and S' .
6. If S and S' are sets, $S = S'$ just in case S and S' have exactly the same members. Accordingly, set-identity is extensional.
7. Let P be a well-formed predicate expression from the natural in question. There exists a set defined by the requirement that it be one and the same with that predicate's extension. This is often called the comprehension axiom.

There are more axioms that we could go on to cite for ST, but these will do for our present purposes.

ST-assignment: Using the above set-up information for ST, show that (and why) the following propositions are objective truths about sets .

- (a) The one and only empty set is \emptyset .
- (b) The registrants in the 2016 version of 324A form a set. (Call this set PL.)
- (c) Donald J. Trump is a member of the complement of PL.

SET-UP MATERIAL FOR TT

1. If S is any well-formed statement-making subject-predicate sentence of the natural language in question, so is “S is true”.
2. Every well-formed statement-making subject-predicate sentence is either true or not true, not both and not neither.
3. For all sentences S of this kind, S is true iff S. Call these sentences truth-predicable.
4. Sentences of this kind are eligible to be the relata of a truth-preserving relation of logical implication.

Further axioms could be given for TT, but we’ve got all that we need for present purposes.

TT-assignment: Using the TT set-up material determine whether and why the following are as a matter of object fact truth-predicable sentences of English.

1. Is it really the case that Donald J. Trump is going to trash NAFTA?
2. Calling \emptyset a set is rather counterintuitive.
3. The grammatically well-formed statement-making subject-predicate sentence printed on the back of this card is true.
4. Get out of here before I call the cops!

Please email me your answers to these questions or bring hard copy to class on Tuesday. If you see the purpose of this exercise, let me know right away. The answer will be announced in class. BTW, there are no trick questions here.