Midterm

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1 Directions

Follow the directions in each section.

2 Entailment

I. For the following sentences determine in each case whether the (a) sentence entails the (b) sentence. If it does not, give a set of circumstances in which the (a) sentence is true and the (b) sentence is false. Example

a. Fido is a mammal.
b. Fido is a dog.

No entailment: Suppose Fido is in fact a cow. Then.

a.	Fido is a mammal.	True
b.	Fido is a dog.	False

(1) a. Mary danced.
b. Mary danced well.

(2) a. Mary danced well.

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b. Mary danced.

(3) a. Mary danced.
b. Either Mary danced or Mary sang.

(4) a. Mary danced or Mary sang.
b. Mary danced.

(5) a. Either Mary danced or she did not dance.
b. Mary danced.

II. For the following sentences determine where the italicized part is in a *downward entailing* or *upward entailing* context. Show entailments supporting your claim.

(6) It is difficult to learn *a Dravidian language*.

(7) It is easy to learn *a Dravidian language*.

(8) John denied that he had seen *a unicorn.*

III. Existence entailments: In the following sentences, is the italicized phrase in a context that carries an existence entailment? If so, spell out exactly what the entailment is. Even if not, give a specific existence claim that is not entailed.

(9) Marie worships *Donnie*.

(10) Fred offered Alicia *a bagel.*

3 Statement Logic

IV. Translate the following sentences into statement logic. Be sure to show what sentence each propositional letter (p, q, , r, ...) stands for. Be sure to represent every propositional connective explicitly (in other words, if you say, "p = "John didn't arrive", you instantly get a zero for that translation because you are not explicitly representing the propositional connective "not"; if you say $\sim p$ = "John didnt arrive", you still haven't told me what p is. In this case, you have to say p = "John arrived.").

(11) a. Neither Betty nor Mark likes beans.
b. Both Betty and Mark like beans
c. The sun rises only if the sun sets.
d. Fred and Ginger like each other.

4 Predicate Logic

V. Translate the following sentences into predicate logic. Use the notation of Chapter 4. Remember to be consistent in your use of relations.

(12) a. Kim is Sandy's soulmate.
b. Kim and Sandy are soulmates.
c. John is Fred's lawyer.
d. John and Fred are lawyers.
e. John married Sue.
f. John and Sue are married. (2 readings. On one reading neither is married to the other. Give both readings.)
g. Bill is unmarried.
h. John slept under the apple tree.

5 Quantifiers, Scope, and Translation

VI. Translate the following sentences into logic. You should use the notation of Chapter 4. Where there are scope ambiguities give more than one translations. If there are indefinites involved in the scope ambiguities, specify which readings are specific and which are non-specific

(13) a. Two students were given an award,
b. Few students took every course in the catalog.
c. A tutor took an assignment to each student with a low grade.
d. No one who likes semantics likes country music.

VII. Consider the following sentence:

(14) The students heard that *Colin Powell* was coming to speak to them.

Is the italicized phrase in an *opaque* or *transparent* context? Give entailment arguments to show whether Leibniz's Law is obeyed.

6 Modality

VIII. Determine for each of the following sentences whether it uses logical, epistemic, or deontic modality (or whether it is ambiguous). Determine whether it describes possibility or necessity. Give its truth definitions in terms of possible worlds. Use D for the perfectly obedient worlds, E for the set of worlds consistent with our knowledge and W for the set of all worlds.

For example, for *John may come to my party*, I claim it is deontic possibility and is true iff

$$\exists w \in \text{D}\ [\text{John comes to my party in w }]$$

(15) a. Frieda might have been a great cellist.
b. The toast must be burning.
c. A good phonetician should not use pliers.
d. Bill Clinton might have been a Republican.

7 Truth conditions & entailments

IX. First, determine whether the following pairs of sentences *entail each other*. Note that means, in each case, checking whether the A sentence entails the B sentence and whether the B sentence entails the A sentence. If the entailment goes in only one direction, you should say so. Then write out translations of both sentences using the predicate logic notation of *Chapter 2*. Finally, whether or not the English sentences entail each other, determine whether your logical translations logically entail each other, or whether there is an entailment in only one direction, or no entailment at all. You don't have to prove this. You can just explain briefly why you think the laws of logic give an entailment, or why you think they don't.

(16) a. No one who likes country music like semantics. (Treat *country music* and *semantics* as names).

b. No one who like semantics likes country music.

(17) a. The Louvre sold the Mona Lisa to the Bargello.
b. The Bargello bought the Mona Lisa from Louvre.

(18) a. John ate a bagel.
b. John ate.

(19) a. Neither Betty nor Mark likes beans. (You may treat "Betty", "Mark", and "beans" as Proper Names)
b. Betty doesnt like beans and Mark doesn't like beans.

(20) a. Everyone who likes semantics likes country music.
b. No one who likes semantics dislikes country music.