

Introduction to Logic: Worksheet 1
Due: 14th November 2008

1. Which of the following are best construed as arguments? If so construable, write out showing premises and conclusion: if not, say why not. Which are deductively valid? Explain your answers.

- a) If God is omnipotent, he is able to prevent credit crunches. But if God is benevolent, and able to, he would prevent credit crunches. So God is not both omnipotent and benevolent.
- b) Some mental events are physical events, as some mental events cause physical events, but only physical events cause physical events.
- c) The Cookie Monster eats all the cookies he likes; these cookies would have been eaten unless he didn't like them. So he must not like these cookies – they haven't been eaten.

6 marks

2. Which of the following are true and which false? Explain your answers.

- a) A valid argument may have a false conclusion.
- b) An unsound argument may have all true premises.
- c) Every valid argument with a true premise is sound.

6 marks

3. Give an example of:

- a) An invalid argument with at least one true premise and a false conclusion.
- b) A valid argument with all false premises and a true conclusion.

2 marks

4. Which of the following claims are true, and which false? Explain your answers.

- a) No logically indeterminate sentences are logically equivalent.
- b) If the premise of an argument is logically equivalent to its conclusion, the argument is valid.
- c) If the conclusion of an argument is logically false, the argument is invalid.
- d) If at least one member of a set of sentences is logically false, the set is logically inconsistent.
- e) If a valid argument has a logically false conclusion, it is unsound.

10 marks

5. Answer the following questions:

- a) Suppose all the premises of a valid argument are logically equivalent to logical truths. What can we conclude about the conclusion? Explain.
- b) Suppose an argument is valid but has a logically false conclusion. What

- can we conclude about its premises? Explain.
- c) Suppose the premises of a valid argument form a consistent set. What can we conclude about its conclusion? Explain.

6 marks

6. Symbolize each of the following sentences as a negation in *SL*, stating what symbolization you use for atomic sentences:

- a) Elmo is not in Fraggle Rock.
b) Some Fraggle is not a Muppett.
c) No Muppett is in Fraggle Rock.

3 marks

7. Symbolise the following sentences in *SL* using the symbolization key given.

P: John is happy
Q: Yoko is sad.
R: Paul will sing

- a) John is not happy but Yoko is not sad
b) If John is happy, either Yoko is sad or Paul will sing
c) Unless Paul will not sing, Yoko is not sad.
d) It is not the case that either Paul will sing or Yoko is not sad.
e) Paul will not sing only if either John is happy or Yoko is sad
f) Either John is happy and Yoko is sad or John is not happy and Yoko is not sad.
g) Only if John is happy if Paul will sing is Yoko sad if John is not happy.

7 marks

8. Show the truth conditions for the exclusive 'or' by means of a truth table. How might the exclusive 'or' be expressed as a biconditional?

4 marks

Total: 44 marks