Elementary Logic
(Philosophy 1006)
Problem Set #1

Name: _____

Student ID:_____

Faculty: _____

email: _____

Mark: _____ %

Due 14 October 2005 by 4:45PM.

Submit your problem set to Ms. Loletta Li in the Main Building room 302.
(If she is not available, go to room 312, the Philosophy department General Office.)
Make sure your problem set is **timestamped**. Do not submit assignments by email.
Late penalty: 10% for each day late.
This problem set will not be accepted after October 20.

Answer the questions on the problem set itself. Write neatly.
If the grader cannot read your handwriting, you will not receive credit.

Be sure that all pages of the assignment are securely stapled together.

Check the course bulletin board for announcements about the assignment.

Do your own work. If you copy your problem set, or permit others to copy,
you may fail course.

Question 1 (10 marks)

True or false?
Circle "T" if the statement is true and circle "F" if the statement is false.

T F Logic is a science which tells us how people actually reason.

T F Sentential logic is an example of an informal system of logic.

T F Logic helps us distinguish good reasoning from bad reasoning.

T F "I am happy" is a syntactically ambiguous sentence.

T F The premises and conclusion of an invalid argument can all be true.

T F The premises and conclusion of a valid argument can all be false.

T F No valid argument has true premises and a false conclusion.

T F The premises and conclusion of a sound argument can all be false.

T F The antecedent of "((A→B) → C)" is "(A → B)".

T F The main connective of "((A→B) & C)" is "→".

/10

Question 2 (10 marks)

Which of the following are statements?
Draw a circle around each statement in the following list:

Where have all the flowers gone?

I'm sorry.

Save the last dance for me.

You were on my mind.

Everybody loves a clown.

Love is is is strange.

I'm a believer.

San Francisco

Tell Laura I love her.

When I was young.

Both sides now.

You don't own me.

/10

Question 3 (10 marks)

Which of the following are valid arguments?
Circle "Yes" if it is an argument which is valid. Circle "No" otherwise.

Yes No All humans are rich.
Mr. Ho is a human.
Therefore, Mr. Ho is rich.

Yes No Bangkok is the capital of Thailand.

Yes No Smoking can cause cancer.
Socrates often smokes.
So, Socrates will get cancer.

Yes No If Plato sees Aristotle, he will be happy.
Plato is happy.
So, Plato saw Aristotle.

Yes No 7 is a prime number.
Therefore, there is no largest prime number.

/10

Question 4 (15 marks)

Give your own example of each of the following.
If no example exists, write "No example exists".
Do not use an example that someone else created.

a. A valid argument with 2 true premises, 1 false premise, and a true conclusion.

b. A sound argument with at least 5 premises.

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c. A sound argument with a false conclusion.

d. A valid argument with no conclusion.

e. An argument which is valid but not sound.

/15

Question 5 (15 marks total)

Find a valid argument, in an article published after 1 August 2005 in an English language newspaper or magazine, which displays one of the valid argument patterns discussed in Topic A03. The valid argument patterns in Topic A03 include modus ponens, modus tollens, hypothetical syllogism, disjunctive syllogism, dilemma, and reductio ad absurdum.

Do not choose the same article as anyone else in the course.
If you choose the same article, you will receive no credit for this question.

a. (3 marks) Attach a copy of the article to this assignment. Draw a circle around the argument you chose.

b. (3 marks) Which valid argument pattern does the argument display?

c. (9 marks) Write down the argument in the standard format.
The argument may have some hidden premises. If it does,
be sure to indicate the hidden premises.

/15

Question 6 (5 marks)

Circle each of the following expressions which is **not** a WFF of SL:

(A&B&A)

(~A→B)

A

((AvB)↔~(A&C)))

~B

/5

Question 7 (10 marks)

a. How many WFFs of SL are there which contain exactly 7 symbols but do not contain the symbol "~"?

b. How many expressions of SL are there which contain no more than 5 symbols and no sentence letter other than "A" or "B"?

c. Write an expression of SL which contains every connective of SL.

d. Write a WFF of SL which is a disjunction, where one disjunct is a conditional, and the other disjunct is a biconditional.

e. Write a WFF of SL which contains exactly 11 symbols and no sentence letter other than "A".

/10

Question 8 (10 marks)

Make a truth table for each of the following WFFs of SL.

a. (A & ~A)

b. ((AvC)→~(B&A))

c. ((A&B)↔(AvB))

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d. (((A→B)v(A→C))→(BvC))

e. ((A&~A)→(Bv(CvD)))

/10

Question 9 (15 marks)

Make correct truth tables by writing a WFF of SL in each blank region:

a.

A	B	
T	T	F
T	F	F
F	T	F
F	F	T

b.

A	B	
T	T	F
T	F	T
F	T	T
F	F	F

c.

A	B	C	
T	T	T	T
T	T	F	F
T	F	T	T
T	F	F	T
F	T	T	F
F	T	F	F
F	F	T	F
F	F	F	T

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d.

A	B	C	
T	T	T	F
T	T	F	F
T	F	T	T
T	F	F	F
F	T	T	T
F	T	F	T
F	F	T	F
F	F	F	F

e.

A	B	C	D	
T	T	T	T	T
T	T	T	F	T
T	T	F	T	T
T	T	F	F	F
T	F	T	T	F
T	F	T	F	F
T	F	F	T	T
T	F	F	F	T
F	T	T	T	T
F	T	T	F	F
F	T	F	T	F
F	T	F	F	F
F	F	T	T	T
F	F	T	F	T
F	F	F	T	T
F	F	F	F	F

/15