Dawson College: Principles of Mathematics and Logic: 360-124-DW-S01: Winter 2013

Name: _____
Student ID: _____

Test 1

No books, calculators, notes or cell phones are allowed. You must show all your work, the correct answer is worth 1 mark the remaining marks are given for the work. If you need more space for your answer use the back of the page.

Question 1. *(2 marks)* Name a logician and state his main contribution to logic.

Question 2.[1] Given the following symbolization key:
A: Alexander Berkman loves Emma Goldman
B_1: Alexander Berkman buys bread.
B_2: Emma Golman buys bread.
E: Emma Goldman loves Alexander Berkman.
F_1: Alexander Berkman buys flowers.
F_2: Emma Goldman buys flowers.
P_1: Alexander Berkman protests.
P_2: Emma Goldman protests.

Translate each English language statement into Propositional Logic.

a. *(3 marks)* Emma and Alexander love each other only if, it is the case that both Emma and Alexander protest.

b. *(3 marks)* Emma buys flowers and Aleaxander buys bread if, neither Alexander loves Emma nor Emma loves Alexander.

Translate each Propositional Logic statement into English.

c. *(1 mark)* $\neg P_2$

d. *(3 marks)* $(\neg P_2 \wedge B_2) \iff E$

[1] not historically accurate

Question 3. *(6 marks)* Determine wether the following statement is a tautology, contradiction, or contingent statement. Justify your conclusion.

$$[(\neg A \to B) \wedge (\neg A \to \neg B)] \to A$$

Question 4. *(6 marks)* Determine whether the following is a valid argument. Justify your conclusion.

$$\neg F_2, (\neg P_2 \wedge B_2) \iff E \therefore E$$

Question 5. Which of the following is possible? If it is possible, give an example. If it is not possible, explain why.

a. *(3 marks)* A valid argument, the conclusion of which is a tautology.

b. *(3 marks)* An invalid argument, the conclusion of which is a tautology.

Bonus Question. *(1 mark)* Why did you choose to study in the Liberal Arts program?