

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) Give a justification for the inclusion of a course on Principles of Mathematics and Logic in the Dawson College Liberal Arts program citing historical examples from liberal education.

Question 2.¹ Given the following symbolization key:

A: Alexander Berkman loves Emma Goldman

B_1 : Alexander Berkman buys bread.

B_2 : Emma Goldman 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 protest only if, it is the case that both Emma buys flowers and Alexander buys bread.

b. (3 marks) Neither Alexander loves Emma nor Emma loves Alexander if, they do not both protest.

Translate each Propositional Logic statement into English.

c. (1 mark) $\neg F_2$

d. (3 marks) $(\neg F_2 \vee B_1) \iff A$

¹not historically accurate

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

$$[(A \rightarrow B) \wedge (B \rightarrow C)] \rightarrow (A \rightarrow C)$$

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

$$\neg F_2, (\neg F_2 \vee B_1) \iff A \therefore A$$

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

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