

Name: \_\_\_\_\_  
Student ID: \_\_\_\_\_

## Quiz: Natural Deduction

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.** Only using the rules of inference and the rules of replacement provided show the following are valid arguments using Fitch style natural deduction:

- a. (10 marks)  $(\neg P \wedge \neg Q) \rightarrow (Q \vee S), Q \rightarrow P, \neg S \vee L, \therefore \neg P \rightarrow L$
- b. (10 marks)  $(G \vee H) \rightarrow \neg P, \neg W \wedge (G \vee Y), Y \rightarrow W, \therefore \neg P$
- c. (10 marks)  $\neg P \rightarrow (V \vee M), \neg S \rightarrow (L \wedge \neg M), (V \wedge L) \leftrightarrow S, \therefore P \vee S$