Section 1: Logic

1. Exclusive Or
For each of the following, decide whether inclusive-or or exclusive-or is intended:

   (a) Experience with C or Java is required.

   (b) Lunch includes soup or salad.

   (c) Publish or perish

   (d) To enter the country you need a passport or voter registration card.

2. Translations
For each of the following, define propositional variables and translate the sentences into logical notation.

   (a) I will remember to send you the address only if you send me an e-mail message.

   (b) If berries are ripe along the trail, hiking is safe if and only if grizzly bears have not been seen in the area.

   (c) Unless I am trying to type something, my cat is either eating or sleeping.

3. Teatime
Consider the following sentence:

   If I am drinking tea then I am eating a cookie, or, if I am eating a cookie then I am drinking tea.

   (a) Define propositional variables and translate the sentence into an expression in logical notation.

   (b) Fill out a truth table for your expression.

   (c) Based on your truth table, classify the original sentence as a contingency, tautology, or contradiction.
4. Truth Tables
Write a truth table for each of the following:

(a) \((p \oplus q) \lor (p \oplus \neg q)\)

(b) \((p \lor q) \rightarrow (p \oplus q)\)

(c) \(p \leftrightarrow \neg p\)

5. Circuitous
Translate the following circuit into a logical expression.