

BBM 205 - Discrete Structures: Quiz 1 - Solutions
Date: 17.10.2018

Name:

Student ID:

1. Your class has a textbook and a final exam. Let P, Q and R be the following propositions:

P: You get an A on the final exam.

Q: You do every exercise in the book.

R: You get an A in the class.

Translate following assertions into propositional formulas using P, Q, R and the propositional connectives AND; NOT; IMPLIES.

- (a) (3 points) You get an A in the class, but you do not do every exercise in the book.

Solution:

$$R \wedge \neg Q$$

- (b) (3 points) You get an A on the final, you do every exercise in the book, and you get an A in the class.

Solution:

$$P \wedge Q \wedge R$$

- (c) (3 points) To get an A in the class, it is necessary for you to get an A on the final.

Solution:

$$R \implies P$$

- (d) (3 points) You get an A on the final, but you don't do every exercise in this book; nevertheless, you get an A in this class.

Solution:

$$P \wedge \neg Q \wedge R$$

2. Classify the following statements as being one of the following, where x and y are arbitrary propositions, and justify your answers (e.g., using a truth table)

- True for all combinations of x and y (Tautology)
- False for all combinations of x and y (Contradiction)
- Neither

(a) (4 points) $x \implies (x \vee y)$

Solution: See the solution in the answers to homework 1.

(b) (4 points) $(x \implies y) \wedge (\neg x \implies y) \wedge (\neg y)$

Solution: See the solution in the answers to homework 1.