PHILADELPHIA UNIVERSITY
DEPARTMENT OF BASIC SCIENCES

First Exam A **DISCRETE STRUCTURES** **12–11–2013**

Part 1 Each problem is worth 2 points. Circle one answer.

1) Which proposition is a tautology ?

a) $p \wedge (p \rightarrow q)$ c) $p \wedge (q \wedge \neg p)$
b) $p \vee (p \rightarrow q)$ d) $p \rightarrow (p \wedge q)$

2) Evaluate GCD (372, 192).

a) 3 b) 6 c) 12 d) 18

3) If $A = \{1, 2, 4, 7\}$ and $B = \{1, 3, 4\}$, then $|P(A \cup B)| =$

a) 4 b) 8 c) 16 d) 32

4) $(\{1, 2, 4, 7\} \oplus \{1, 3, 4, 5\}) - \{3, 4, 5\} =$

a) {2, 7} b) {1, 7} c) {4, 5, 7} d) {4, 7}

5) Which number is a multiple of 4 and 5 ?

a) 460 b) 612 c) 690 d) 816

6) How many permutations of the elements A, A, B, B, C, C, C ?

a) 35 b) 105 c) 140 d) 210

Part 2 Each problem is worth 4 points. Write complete solution.

7) Convert $((P \leftrightarrow Q) \vee \neg R) \rightarrow P$ to CNF.

8) How many multiples of 4 or 10 or 15 from 1 to 200 ?

-Amin Witno