Department of Basic Sciences — Philadelphia University

Exam 1 **Discrete Structures** **28–11–2016**

Part I. (1 point each) Multiple choice: circle one answer.

1. The proposition $(p \vee q) \to q \equiv$

   (A) $p \to q$ (B) $q \to p$ (C) $\neg p \to q$ (D) $\neg q \to p$

2. The set $\{1, 2, 4, 5\} \oplus \{2, 4, 6\} =$

   (A) $\{1, 5\}$ (B) $\{2, 4, 6\}$ (C) $\{2, 4\}$ (D) $\{1, 5, 6\}$

3. Let $A = \{1, 2, 3, 4\}$ and $B = \{3, 4, 5\}$. Then $|P(A - B)| =$

   (A) 2 (B) 4 (C) 8 (D) 16

4. The set $A - (A \oplus B) =$

   (A) $A \cup B$ (B) $A \cap B$ (C) $A - B$ (D) $\emptyset$

5. The remainder 5634 mod 11 =

   (A) 0 (B) 1 (C) 2 (D) 7

6. A multiple of 8 is

   (A) 222 (B) 225 (C) 245 (D) 256

7. The number of non-negative integer solutions for $A + B + C = 15$ is

   (A) 105 (B) 120 (C) 136 (D) 153

Part II. Complete solution: write your solution on a separate page.

8. (2 points) Evaluate $\gcd(4050, 540)$ using the Euclidean algorithm.
9. (3 points) Convert the proposition $(P \to Q) \leftrightarrow R$ to CNF.
10. (3 points) Let A be a set with $|A| = 13$. Count how many subsets of A which contain at least 3 elements.
11. (5 points) From 1 to 400, count how many integers which are NOT multiples of 8 or 12 or 18.

–Amin Witno