Department of Basic Sciences — Philadelphia University

Exam 1 **Discrete Structures** **05–04–2015**

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

1. $p \to \neg q \equiv$

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

2. $(p \leftrightarrow q) \to (p \oplus q)$ is a

   (A) tautology (B) contradiction (C) contingency (D) false

3. $(\{1,2,3,4,7\} - \{2,4,6\}) \oplus \{3,5,7\} =$

   (A) $\{1,5\}$ (B) $\{1,6\}$ (C) $\{1,7\}$ (D) $\{1,5,6\}$

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

   (A) 2 (B) 4 (C) 8 (D) 32

5. Which number is a divisor of 30 and 75 ?

   (A) 4 (B) 6 (C) 9 (D) 15

6. Which number is a multiple of 6 ?

   (A) 222 (B) 235 (C) 245 (D) 256

7. How many permutations with the elements A, A, A, A, C, C ?

   (A) 15 (B) 30 (C) 60 (D) 90

8. How many permutations with A, B, C, D, E, F, G contain 'ED' ?

   (A) 6 (B) 24 (C) 120 (D) 720

Part II. (4 points each) Write complete solution on the separate blank page provided.

9. Evaluate $\gcd(4242, 504)$.
10. Convert the proposition $(P \to \neg Q) \leftrightarrow R$ to CNF.
11. From 1 to 300, how many are multiples of 8 or 18 or 12 ?

–Amin Witno