PHILADELPHIA UNIVERSITY
DEPARTMENT OF BASIC SCIENCES

Second Exam A   **DISCRETE STRUCTURES**   **16–12–2008**

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

1)   Which set is equal to $A \cap B$?

   a) $(A - B) \oplus A$ b) $(A - B) \oplus B$
   c) $(A - B) \oplus (B - A)$ d) none of the above

2)   Suppose $|A| = 10$. How many subsets of A have 5 elements?

   a) 120   b) 720   c) 252   d) 210

3)   How many solutions to $x + y + z = 10$ which are integers with $x,y,z \geq 1$?

   a) 36   b) 45   c) 21   d) 28

4)   Let $A = \{2,3,5,7\}$ and $B = \{1,3,4,7\}$. Then $(A \oplus B) \oplus B =$

   a) $\{1,3,4,7\}$ b) $\{1,2,4,5\}$ c) $\{2,3,5,7\}$ d) $\{3,7\}$

5)   There are 8 faculties at Philadelphia University. How many students minimum so that at least 14 will belong to the same faculty?

   a) 99   b) 112   c) 105   d) 113

6)   Let $A = \{1,2,3,4\}$ and $B = \{0,2,4,8\}$. Then $|P(P(A \cap B))| =$

   a) 8   b) 16   c) 64   d) 256

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

7)   How many different permutations from the set {A, M, E, O, S, N, T} which do not contain the word SET or MAN?

8)   How many positive integers ≤ 1000 which are multiples of 9 or 12 or 15?

-Amin Witno