

Department of Basic Sciences — Philadelphia University

Exam 1

Discrete Structures

22–11–2018

Part I. (1 point each) Circle one answer.

1. The proposition $\neg p \vee \neg q \equiv$

- (A) $\neg p \rightarrow q$ (B) $p \rightarrow \neg q$ (C) $\neg p \rightarrow \neg q$ (D) $p \rightarrow q$

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

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

3. Let $A = \{2, 3, 5\}$ and $B = \{3, 5, 6\}$. Then $|P(A \cup B)| =$

- (A) 2 (B) 4 (C) 16 (D) 32

4. Convert the binary number 1001001 to decimal.

- (A) 73 (B) 74 (C) 81 (D) 82

5. $\text{GCD}(84, 24) =$

- (A) 3 (B) 4 (C) 6 (D) 12

6. $6^{64} \bmod 11 =$

- (A) 3 (B) 4 (C) 5 (D) 9

7. $2^{-1} \bmod 11 =$

- (A) 4 (B) 5 (C) 6 (D) 7

Part II. Write complete solution.

8. (4 points) Convert the proposition $(P \rightarrow \neg Q) \leftrightarrow \neg R$ to CNF.
9. (4 points) Find integers A and B such that $\text{GCD}(444, 45) = 444A + 45B$.
10. (5 points) Count how many multiples of 6 or 9 or 10, from 1 to 300.

–Amin Witno