PHILADELPHIA UNIVERSITY
DEPARTMENT OF BASIC SCIENCES

Discrete Structures (210104) — Paper: Exam 1 Form (A)
Discrete Mathematics (210242) — Date: 18 April 2006
Discrete Mathematics (250151) — Time: 02:10 – 3:00 pm
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Name: ***No.***

PART 1. Circle the right answer. (2 points each)

1. The LCM(237,115) =
   a) 3 b) 27255 c) 115 d) 9085

2. Convert the decimal number 125.625 to Hexadecimal.
   a) 7D.5 b) D7.5 c) 7D.A d) D7.A

3. Convert the hexadecimal number $(4FE)_{16}$ to octal
   a) $(2376)_8$ b) $(3474)_8$ c) $(773)_8$ d) $(2256)_8$

4. The hexadecimal number $\mathrm{A\,B\,.\,8\,D}$ is equal to the binary number
   a) 10101011.10001110 b) 10111010.10000111
   c) 11011000.11101000 d) 10001101.11101000

5. The Proposition $p \to (q \vee r) \equiv (p \to q) \vee (p \to r)$ is a
   a) tautology b) contingency c) contradiction d) none of the above

6. The statement $(\sim P \wedge Q) \to R$ is logically equivalent to the statement
   a) $(p \vee \sim Q) \wedge R$ b) $(\sim p \wedge Q) \wedge R$
   c) $(P \wedge \sim Q) \to \sim R$ d) $(\sim P \wedge \sim R) \to \sim Q$

7. Converting the proposition $\sim (p \wedge q) \to p$ to a CNF gives
   a) $(p \wedge \sim q) \vee (p \wedge q)$ b) $(\sim p \vee q) \wedge (\sim p \vee \sim q)$
   c) $(p \vee \sim q) \wedge (p \vee q)$ d) $(\sim p \wedge q) \vee (\sim p \wedge \sim q)$

8. Which of the following statement is <u>False</u> in the domain D = R (the set of Real numbers)
   a) $\exists x, \forall y : x \cdot y = 0$ b) $\exists x, \forall y : x \cdot y = y$
   c) $\forall x, \exists y : x + y = 0$ d) $\exists x, \forall y : x + y = 0$

9. The explicit formula for the recurrence relation give by
   $S_n = 4S_{n-1} - 4S_{n-2}, \quad S_0 = 1$ and $S_1 = 3$ where $n > 1$ is
   a) $S_n = (-2)^n + \frac{1}{2} n (-2)^n$ b) $S_n = (2)^n + \frac{1}{2} n (2)^n$
   c) $S_n = \frac{1}{2}(2)^n + n(2)^n$ d) $S_n = (2)^n + \frac{1}{2}(2)^n$

10. Which of the following argument is valid