Propositional Logic

Practice Questions

Directions: Choose the letter of the correct answer for each question below.

1) Which of the following is a proposition that has a truth value of TRUE?
(a) All negative numbers have a negative cube
(b) There is no rational number between 0 and 1
(c) 15 is the only multiple of 5 between 10 and 50
(d) 3 is the smallest prime nonnegative integer

2) Let *p* be the proposition *"There is no rational number between 0 and 1," q* be the proposition "*2 is the smallest prime nonnegative integer"* and *r* be the proposition *"$3^2 = 9$."* What is the truth value of $\sim r \ \vee \ p \ \Rightarrow \ q$?

(a) True
(b) False

3) Using the same propositions in item 2, translate "If $3^2 = 9$, then 2 is not the smallest prime nonnegative integer or there exists a rational number between 0 and 1" using propositional variables *p, q,* and *r*.

(a) $r \Rightarrow \ \sim q \ \vee \ \sim p$
(b) $r \Rightarrow \ q \ \vee \ p$
(c) $r \Rightarrow \ q \ \vee \ \sim p$
(d) $r \Rightarrow \ \sim q \ \vee \ p$

4) Which of the following conditional statements has a false converse?
I. If a number is an integer, then it is also a rational number.
II. If an organism is a man, then that organism can run.
III. If an angle is obtuse, then the angle is not an acute angle.
IV. If a segment is the diameter of a circle, then that segment is also a chord.

(a) I and III
(b) II and IV
(c) II only

(d) all statements are false

5) Form the contrapositive of "*If x + y is divisible by 3, then xy is not divisible by 3*".

(a) If both x and y are not divisible by 3, then x + y is not divisible by 3
(b) If xy is divisible by 3, then x + y is divisible by 3
(c) If xy is divisible by 3, then x + y is not divisible by 3
(d) If xy is divisible by 3, then both x and y are not divisible by 3