INTEGER NUMBERS

1. If $s=a+b$, $t=b-c$, $u=c-a$, can the sum $s+t+u$ be positive or negative?

2. If a and b are different integers and $5a + b = 32$, what is the sum of all possible values of a?
   a) 6 b)11 d)15 e)18 f)21

3. The product of two integers is between 102 and 115. which of the following CANNOT be on of the integers?
   A)5 B)10 C)12 D)15 E)20

4. If $a + 2a = 3a = 3b - 3$ and if $b = 1$, what is the value of a?

5. If x and y are positive integers, $x + y < 15$, and $x > 5$, what is the greatest possible value of $x - y$?

6. 1,2,1, -1, -2, ….
   The first five terms of a sequence are shown above. After the second term, each term can be obtained by subtracting from the previous term the term before that. For example, the third term can be obtained by subtracting the first term from the second term. What is the sum of the 36 term in the sequence?
   A) 0 B) 4 C) 12 D) 24 E) 30

7. If k and j are integers and $j + k = 2j + 4$, which of the following must be true?
   I . j is even
   II. k is even
   III k – j is even
   A) None B) only I C) II only D) III only E)I, II and III

8. In a certain sequence of numbers each number except the first is 4 plus twice the previous number. If the fourth number is 16, what is the second number?

9. How many different pairs of unequal numbers an be formed from the set below so that their sum is greater than 12?

10. If n is an integer greater than 2, what is the next greater even integer in terms of n?
    a) n+1 b) n+2 c) n+3 d) 2n e) n^2

11. We call consecutive integers the integers that follow in sequence, for example, 22,23,24,25
    How can consecutive integers be more generally represented?

12. A pattern of counting numbers is shown: 14,15,16,17,18,19,20,…
    a. Which of these numbers is a square number?
    b. Which of them is a multiple of nine?
    c. What is the next square number?
    d. What is the next number that is multiple of 9?

13. If m and n are two different prime numbers greater than 2, which of the following must be true?
    I. their sum is greater than 7
    II. their product is an odd number
    III. their product is a prime number
    A) I only B)II only C)I and II only
    D)II and III only E) I, II and III

14. If x and y are integers, what is greater: x+1 or y-1?

15. Let $0<a<b<1$. which of the following is true?
    a. a^3 is greater than b^2
    b. b^2 is greater than a^3
    c. a^3 is equal b^2
    d. the relationship can't be determined

16. For positive integer values of n, define n▲ to be the sum of the integers from 1 to n, inclusive.
    For example, 3▲ = 1+2+3=6
    If 10▲ - 9▲ = k▲, what is the value of k?
    A)1 B) 4 C)10 D) 46 E)55

17. For positive integer value of *n*, suppose that n! is a product of the integers from1 to *n* inclusive.
    If 6! : 5! = k!, what is the value of *k*?

18. Let <m,n> be defined as the set of all integers between m and n, excluding m and n. for example, <0; 3,5> = {1,2,3}.
    If x is in <2,6> and y is in <6,9>, compare x and y.