NUMBER THEORY

1. If $a+b+c=2$ & $ab+bc+ca=1009abc$,then find $\frac{a(b^2+c^2)+b(c^2+a^2)+c(a^2+b^2)}{abc}$

(A) 2002 (B) 2005 (C) 2014 (D) 2015

2. HCF of $\frac{39}{10}+\frac{10}{39}, \left(\sqrt{2}\right)^2+(3.9)^2+\frac{1}{15.21}$ and $(3.9)^3+\left(\frac{1}{3.9}\right)^3+3\left(\frac{39}{10}+\frac{10}{39}\right)$

(A) $3.9+\frac{1}{3.9}$ (B) $\left(3.9+\frac{1}{3.9}\right)^2$ (C) $\left(3.9+\frac{1}{3.9}\right)^3$ (D) 1

3. Find the value of $\frac{1}{1+\sqrt{2}}+\frac{1}{\sqrt{2}+\sqrt{3}}+\frac{1}{\sqrt{3}+\sqrt{4}}+.......+\frac{1}{\sqrt{8}+\sqrt{9}}$

(A) 0 (B) 1 (C) 2 (D) 3

4. If HCF (a, b) = 12 and a × b = 1800, then LCM(a, b) =

(A) 3600 (B) 900 (C) 150 (D) 90

5. If a,b are two positive integers then which of the following is greatest

(A) a (B) b (C) LCM of (a,b) (D) HCF of (a,b)

6. The remainder when 2^{2011} is divided by 2011.

(A) 2 (B) 3 (C) 4 (D) 0

7. Find the value of $2015^3-2014\times2015\times2016$

(A) 0 (B) 2015 (C) 2014 × 2016 (D) 2 × 2015

8. ΔABC has integral sides AB,BC measuring 2008 units and 1003 units respectively, the number of such triangles are

(A) 2010 (B) 2020 (C) 2015 (D) 2008

9. P is the smallest positive integers such that every positive integer greater than P can be written as a sum of two composite numbers then

(A) P=3 (B) P=6 (C) P=10 (D) P=11

10. Find last digit of $(1!+2!+3!+..........+100!)^2$

(A) 4 (B) 6 (C) 0 (D) 1

11. If the four positive integers A,B,C,D satisfy the condition that $A^5=B^4$, $C^3=D^2$, $C=A+19$, then the value of $D-B$ is

(A) 575 (B) 757 (C) 557 (D) 775

12. Let X = 2001! and Y = 2002 × 2003 × 2004, then the L.C.M of X & Y is

(A) 2003 × 2011! (B) 2001 × 2003! (C) 2003! (D) 2001!

13. n^5-5n^3+4n is always divisible by

(A) 120 (B) 100 (C) 125 (D) 111

14. If p is prime, n is +ve a integer such that $n+p=2000$ and LCM of n & p is 21879, then the value of p & n.

(A) 3 (B) 5 (C) 7 (D) 11

15. $1^{2017}+2^{2017}+3^{2017}+......+2017^{2017}$ is divisible by

(A) 2015 (B) 2016 (C) 2017 (D) 2000

16. If $3a = 4b = 6c$ and $a + b + c = 27\sqrt{29}$, then the value of $5\left(\sqrt{a^2 + b^2 + c^2} + 316\right)$ is

(A) 2015 (B) 2005 (C) 2016 (D) 2006

17. Suppose that N is a 6 digit number 'abcdef'. If N is $\frac{6}{7}$ of number 'defabc', then find the value of 'a + b + c + d + e + f'

(A) 25 (B) 26 (C) 27 (D) 28

18. If $n_1, n_2, n_3, \ldots\ldots, n_{2015}$ are not necessarily distinct and let

$$X = (-1)^{n_1} + (-1)^{n_2} + (-1)^{n_3} + \ldots + (-1)^{n_{1009}} \; ; \; Y = (-1)^{n_{1008}} + (-1)^{n_{1009}} + (-1)^{n_{1010}} + \ldots + (-1)^{n_{2018}},$$

then the value of $(-1)^X + (-1)^Y$ is

(A) 0 (B) 1 (C) 2 (D) None

19. If $n = (123456789)(76543211) + (23456789)^2$, then the sum of the digits of n is

(A) 2015 (B) 2016 (C) 2017 (D) 2018

20. Find the product of $101 \times 10001 \times 100000001 \times \ldots\ldots \times (1000\ldots\ldots01)$. Where the last factor has $2^7 - 1$ zeros between the ones. Find the number of ones in the product.

(A) 124 (B) 125 (C) 126 (D) 128

KEY

1.	C	**2.**	A	**3.**	C	**4.**	C	**5.**	C
6.	A	**7.**	B	**8.**	C	**9.**	D	**10.**	C
11.	A	**12.**	A	**13.**	A	**14.**	D	**15.**	C
16.	A	**17.**	C	**18.**	D	**19.**	D	**20.**	D