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|  | Name 1 |  |
| **Name 2** |  |
| **Name 3** |  |
| **School Name** |  |
| **Marks** |  |
| **Tie Score** |  |

### Quick Facts

* **25** Questions
* No Negative Marking
* Duration: 1 hour.
* **In built Tie-Breakers**

#### IYMC SENIOR PRELIMS

1. If |a| = |b| ≠ 0 and , then represents



1. A circle B) An ellipse C) A straight line D) A point

2. If α, β, γ and δ are the roots of (x2+x+4)2 + 3x(x2+x+4) + 2x2 = 0, then |α| + |β| + |γ| + |δ| is equal to?

1. 6 B) 8 C) 12 D) 25

3. If a and b are two positive real numbers and A, G, H are arithmetic mean, geometric mean and harmonic between a and b respectively, then A≥G≥H and the equality holds if and only if

A) a>b B) a<b C) a=b D) None of the above

4**.** Let an = 111……1 (n times). The remainder when a124 is divided by 271 is

1. 23 B) 25 C) 27 D) 29

5.The number log27 is

1. An integer B) A rational number C) An irrational number D) A prime number

6.The number of non negative integral solutions of x1+x2+…..+xr = n is

1. n+r-1Cr-1 B) nCr C) n-rCr-1 D) n+rCr-1

7. logθ(x) f(x) ≥ logθ(x) f(x) ⬄ 0<f(x)≤g(x) is true for what range of θ(x)?

1. θ(x) > 1 B) θ(x) < 0 C) 0<θ(x)<1 D) None of these

8. Number of solutions of log4(x-1) = log2(x-3) is

1. 3 B) 1 C) 2 D) 0

9. Number of zeroes at the end of 100! Is

1. 20 B) 22 C) 24 D) 26

10. For what value(s) of n, is C1-2C2+3C3-….+(-1)n-1 nCn = 0?

1. n<0 B) n>0 C) 0<n<1 D) n>1

11. If a = 99100, b = 10099, then

1. a>b B) a=b C) a<b D) a+2b = 101100

12. If and then the value of α for which A2 = B is



1. 1 B) -1 C) i D) No real values

13. The inverse of a Skew symmetric matrix of odd order is?

1. A symmetric matrix B) A skew symmetric matrix C) Diagonal matrix D) Does not exist

14. The determinant of = = what value?



15. If cos 2β = cos (α+γ)/cos (α-γ), then tan α, tan β and tan γ are in

1. A.P B) G.P C) H.P D) None of these

16. What is the sum to infinity of s = 1 + (-1) + 1 + (-1) +……

1. 0 B) 1 C) 1/2 D) Indeterminate

17. Compute: (100-1)(100-2)(100-3)…..(100+1)(100+2)(100+3)

1. 0 B) 11110000 C) 111110000 D) 999200000

18. Which is the only number which can be represented as the sum of two cubes in two different ways?

1. 769 B) 1729 C) 482 D) 1168

19. The inequality sin-1x > cos-1x holds for

1. All values of x B) x ϵ (0, 1/) C) x ϵ (1/, 1] D) No value of x



20. The point (a, b+c), (b, c+a) and (c, a+b) are

1. Vertices of an equilateral triangle B) Concyclic C) Vertices of a right angled triangle D) None of these

21**.** If the two circles x2+y2+2gx+2fy = 0 and x2+y2+2g 1x+2f1y = 0 touch each other, then

1. f1g = fg1  B) ff1 = gg1 C) f2+g2 = f12+g12 D) None of these

22. The sine of the angle between the pair of lines represented by the equation x2-7xy+12y2=0 is

1. 1/12 B) 1/13 C) 1/√170 D) None of these



23**.** If e and e1 are the eccentricities of a hyperbola and its conjugate, then 1/e2 + 1/e12 is equal to

1. -1 B) 0 C) 1 D) None of these

24**.** In the domains of functions, dom (f+g) gives

1. dom f ∩ {x: f(x) ≥ 0} B) dom f ∩ dom g C) dom f ∩ dom g ∩ {x:g(x) ≠0} D) None of these

25. If f(x) = then at x = 1



1. f is not continuous B) f is continuous but not differentiable C)f is differentiable

D) the derivative is 1

**\*\*\*\*\*\*\*\*\*All The Best For The Finals\*\*\*\*\*\*\*\*\*\*\*\*\***