NTSE

IMPORTANT QUESTIONS
MATHEMATICS

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1. If the sum of zeros of the polynomial $p(x) = kx^3 - 5x^2 - 11x - 3$ is 2, then k is equal to:

   (A) $k = -\dfrac{5}{2}$ (B) $0:1$

   (C) $\pi:1$ (D) $\pi:2$

2. If the sum of the ages of a father and his son in years is 65 and twice the difference of their ages in years is 50, then the age of father is

   (A) 45 years   (B) 40 years
   (C) 50 years   (D) 55 years

3. The quadratic equation $3x^2 + 2(a^2 + 1)x + a^2 - 3a + 2 = 0$ possesses roots of opposite sign then a lies in :

   (A) $(-\infty, 0)$ (B) $(-\infty, 1)$

   (C) $(1, 2)$ (D) $(4, 9)$

4. If a is a positive integers and p be a prime number and p divides a^2, then

   (A) a divides p   (B) p divides a
   (C) p^2 divides a   (D) None of these

5. The area of a triangle whose vertices are $(a, c+a), (a, c)$ and $(-a, c-a)$ are

   (A) a^2 (B) b^2
   (C) c^2 (D) $a^2 + c^2$

6. If the nth term of an A.P. be $(2n-1)$ then the sum of its firs n terms will be

   (A) $n^2 - 1$ (B) $(2n-1)^2$

   (C) n^2 (D) $n^2 + 1$

7. A toy is in the form of a cone mounted on a hemisphere of radius 3.5 cm. The total height of the toy is 15.5 cm. The total surface area is $\left(\text{use } \pi = 3\dfrac{1}{7} \right)$

   (A) $241.5\,cm^2$ (B) $214.5\,cm$

   (C) $412.5\,cm^2$ (D) $124.5\,cm^2$

8. The cost of cutting the crops of circular field of radius 35 m is Rs. 4750. What shall be the cost of cutting the crops at the same rate on another circular field whose radius is $\dfrac{1}{5}$ of the first?

   (A) Rs. 190   (B) Rs. 180

   (C) Rs. 170   (D) Rs. 150

9. ABC is a right angled triangle, right angled at B such that BC = 6 cm and AB = 8 cm. A circular with centre O is inscribed in ΔABC. The radius of the circle is

   (A) 1 cm   (B) 2 cm

   (C) 3 cm   (D) 4 cm

10. The value of $\left(\sin^2 \dfrac{1°}{2} + \cos^2 7\dfrac{1°}{2} \right) - \left(\sin^2 30° + \cos^2 30° \right) + \left(\sin^2 7° + \cos^2 85° \right)$ is equal to

    (A) 3   (B) $3\dfrac{1}{2}$

    (C) 2   (D) 1

11. The mean of the squares of the first n natural number is

    (A) $n^2 + 1$ (B) $\dfrac{n^4 + 1}{n}$

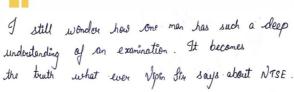   (C) $\dfrac{(n+1)(2n+1)}{6}$ (D) $\dfrac{(n+1)(n+2)}{m}$

12. 5 coins are tossed simultaneously. The change that all will show head is :

    (A) $\dfrac{1}{64}$ (B) $\dfrac{1}{32}$

    (C) $\dfrac{1}{2}$ (D) None of these

13. The mean wage of 150 labours working in a factory running three shift with 60, 40 and 50 labours is Rs. 114. The mean wage of 60 labourers working in the first shift Rs. 121.50 and that of 40 labourers working the second shift is Rs. 107.75, then wage of those working in the third shift is

(A) Rs. 110   (B) Rs. 100

(C) Rs. 120   (D) Rs. 115.75

14. The sides of a triangle are 35 cm, 54 cm and 61 cm, respectively. The length of its longest altitude

(A) $16\sqrt{5}\,cm$ (B) $10\sqrt{5}\,cm$

(C) $24\sqrt{5}\,cm$ (D) $28\,cm$

15. If one of the angles of a triangle is $130°$, then the angle between the bisectors of the other two angles can be

(A) 50°   (B) 65°

(C) 145°   (D) 155°

16. The vertices of a triangle AOD are (4, 0), (0, 0) and (0, 3). If the triangle is rotated clockwise about its circumcenter till AD returns to its original position, then the vertices of the triangle in its new position are

(A) $(3, 0)\,(0, 0),\,(0, 4)$ (B) $(-3,0),(0,0)(0,-4)$

(C) $(3,4),(0,0)(0,4)$ (D) $(-4,0),(0,0)(0,0),(0,3)$

17. $$\dfrac{\left(x^{a+b}\right)^2\left(x^{b+c}\right)^2\left(x^{c+a}\right)^2}{\left(x^a.b^b.x^c\right)^4}$$

(A) -1 (B) 1

(C) 0   (D) None

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