ఈనాడు
సోమవారం 27 ఏప్రిల్ 2020 ■ email: help@eenadupratibha.net
ప్రతిభ

The Sum of the coefficients..?

Quadratic equations and expression, Theory of equations and Binomial theorem, Partial fractions

Straight Objective Type

1. If a ∈ Z and the equation (x – a) (x – 10) + 1 = 0 has integral roots, then the values of a are
1) 10, 8 2) 12, 10 3) 12, 8 4) 10, 14

2. If the sum of the squares of the roots of the equation $x^2 - (\sin\alpha - 2)x - (1 + \sin\alpha) = 0$ is least then α =
1) $\frac{\pi}{6}$ 2) $\frac{\pi}{4}$ 3) $\frac{\pi}{3}$ 4) $\frac{\pi}{2}$

3. If a < 0 and $b^2 - 4ac < 0$ then the graph of $y = ax^2 + bx + c$
1) lies entirely below the x-axis
2) cuts the x-axis
3) touches the x-axis
4) lies entirely above the x-axis

4. If the sum of two roots of $x^5 + lx + m = 0$ is zero then the value of m =
1) 1 2) –1 3) 0 4) –3

5. At least one root of $x^3 - 7x + 7 = 0$ lies between
1) 0, 1 2) 1, 2 3) – 4, –3 4) – 1, 0

6. The greatest value of term independent of x in the expansion $\left(x\sin\theta + \frac{\cos\theta}{x}\right)^{20}$ (where θ ∈ R) is
1) $\sqrt{2}$ 2) ${}^{20}c_{10}$
3) $2^{10}.{}^{20}c_{10}$ 4) $2^{-10}.\ {}^{20}c_{10}$

7. The number of zeros at the end of $(101)^{11} - 1$ is.....
1) 2 2) 4 3) 6 4) 8

8. If $\sum_{r=0}^{n} \frac{r}{{}^nc_r} = \sum_{r=0}^{n} \frac{7}{{}^nc_r}$ then n = ...
1) 7 2) 14 3) 16 4)12

9. The Sum of the coefficients of even powers of x in the expansion of $(1 + x + x^2 + x^3)^5$ is 2^n Then n = ...
1) 5 2) 7 3) 9 4) 11

10. The number of rational terms in $\left(\sqrt[3]{25} + \frac{1}{\sqrt[4]{10}}\right)^{20}$ is
1) 2 2) 4 3) 6 4) 8

11. If the coefficient of x^n in $\frac{x}{(x-1)^2(x-2)}$ is C_n Then $\lim_{n\to\alpha} \frac{C_n}{n} =$
1) –1 2) 1 3) 0 4) $\frac{1}{2}$

Numerical Value Type

12. If $\frac{(x+1)^2}{x(x^2+1)} = \frac{A}{x} + \frac{Bx + C}{x^2+1}$ Then $\cos^{-1}\left(\frac{A}{C}\right)$ = ...

13. If $\frac{1}{\angle 1\ \angle 9} + \frac{1}{\angle 3\ \angle 7} + \frac{1}{\angle 5\ \angle 5} + \frac{1}{\angle 7\ \angle 3} + \frac{1}{\angle 9\ \angle 1} = \frac{2^n}{\angle 10}$ Then n = ...

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14. If α is a positive root of $x^4 + x^3 - 4x^2 + x + 1 = 0$ then $\alpha + \frac{1}{\alpha}$ = ...

15. Consider the equation $x^2 + 2x - n = 0$ (n ∈ N) and n ∈ [5 100] Total number of different values of 'n' so that the given equation has integral roots is .....

Answers

1-3 2-4 3-1 4-3 5-3 6-4 7-1 8-2 9-3 10-1 11-1 12-1.04 13-9 14-2 15-8

Permutations and Combinations, Probability, Measures of Dispersion

Straight Objective Type

1. If ${}^nP_a = {}^nP_b$ where a < b ≤ n (all are positive integers) and a + b = Fn + G then |F| + |G| = ...
1) 1 2) 2 3) 3 4) 4

2. If n is an integer between 0 and 21 then the minimum value of ∠n ∠(21 – n) =
1) ∠9 ∠12 2) ∠10 ∠11 3) ∠20 4) ∠21

3. An n digit number is positive number with exactly 'n' digit. Nine hundred distinct n – digit numbers are to be formed using three digit 2, 5 and 7. The smallest value of 'n' for which this is possible is
1) 3 2) 5 3) 7 4) 9

4. The highest exponent of 7 in ∠100 is
1) 10 2) 12 3) 14 4) 16

5. The range of the function $f(x) = {}^{(7-x)}P_{(x-3)}$ is
1) {1, 2, 3} 2) {2, 3, 4}
3) { 1, 3, 4} 4) {1, 2, 4}

6. The number of distinct rational numbers x such that 0 < x < 1 and $x = \frac{p}{q}$ where p, q ∈ {1, 2, 3, 4, 5, 6} is
1) 11 2) 12 3) 10 4) 15

7. Two numbers are chosen at random from {1, 2, 3, 4, 5, 6} at a time. The probability that the smaller of the two is < 4 is
1) $\frac{1}{5}$ 2) $\frac{2}{5}$ 3) $\frac{3}{5}$ 4) $\frac{4}{5}$

8. A man is known to speak truth 3 out of 4 times. He throws a die and reports that it is a six. The probability that it is actually six is
1) $\frac{1}{8}$ 2) $\frac{3}{8}$ 3) $\frac{5}{8}$ 4) $\frac{7}{8}$

9. A critical point x_1 of the function $f(x) = x^3$ is selected at random. The probability that f has extremum at x_1 is
1) $\frac{1}{3}$ 2) $\frac{2}{3}$ 3) $\frac{1}{4}$ 4) 0

10. In a Binomial distribution n = 400, $P = \frac{1}{5}$ then standard deviation is
1) 10 2) 8 3) $10\sqrt{2}$ 4) $2\sqrt{2}$

11. The probability of a coin showing head is P. Now 100 coins are tossed. If the probability of 50 coins showing heads is same as the probability of 51 coins showing heads then the value of P =
1) $\frac{1}{2}$ 2) $\frac{49}{100}$ 3) $\frac{51}{101}$ 4) $\frac{1}{3}$

12. If the range of 6 observation is 14. If the least observation is 4. Then the greatest observation is
1) 18 2) 16 3) 14 4) 12

13. If the coefficient of variation and standard deviation of a distribution are 2 and 0.4 respectively then its mean =
1) 10 2) 20 3) 30 4) 40

14. The standard deviation of 4, 7, 10, 13, 16, 19, 22 is =
1) 2 2) 6 3) 8 4) 4

Numerical Value Type

15. A JEE Main Problem in Mathematics is given to three students whose chances of solving it are $\frac{1}{2}, \frac{1}{3}$ and $\frac{1}{4}$ respectively. The probability that the problem being solved is

16. A and B are two particular persons who addresses a conference with 8 more speakers. If the addressing is at random, the probability that B speaks after A is

17. Three vertices of a regular hexagon are selected at random. The probability that they form an equilateral triangle is

18. The least positive integer n for which ${}^{(n-1)}c_5 + {}^{(n-1)}c_6 < {}^nc_7$ is K then the value of $\frac{K}{10}$ = ...

19. Let n = 2015, the least positive integer K for which $Kn^2(n^2 - 1^2)(n^2 - 2^2)(n^2 - 3^2)\ldots\ldots(n^2 - (n-1)^2) = \angle r$ for some positive integer r is......

20. The number of integral solutions of $x^2 + y^2 = x^2y^2$ is......

21. If $\frac{1}{{}^4c_n} = \frac{1}{{}^5c_n} + \frac{1}{{}^6c_n}$ then the value of n =

22. In a football championship 36 matches were played. Every team played one match with each other. The number of teams participating in the championship is..

23. If [y] denote the greatest integer ≤ y and $2\left[\frac{x}{8}\right]^2 + 3\left[\frac{x}{8}\right] = 20$ then x lies in the smallest interval [a b) where b = a is equal to

24. Let T_n denote the number of triangles which can be formed by using the vertices of regular polygon of n sides. If $T_{n+1} - T_n = 21$ then n =

Answers

1-3 2-2 3-3 4-4 5-1 6-1 7-4 8-2 9-4 10-2 11-3 12-1 13-2 14-2 15-0.75 16-0.5 17-0.10 18-1.4 19-2 20-1 21-2 22-9 23-8 24-7

Functions, Sets and Relations, Matrices

Straight Objective Type

1. If f: R → R is a functions satisfying f(x + y) = f(xy) for all x, y ∈ R and $f\left(\frac{3}{4}\right) = \frac{3}{4}$ then f(2020) =.......
1) 2020 2) $\frac{1}{2020}$ 3) $\frac{3}{4}$ 4) 0

2. If f: R → R is defined by $f(x) = 2^x$ and $\sum_{k=1}^{n} f(a + K) = 16(2^n - 1)$ (n∈N) then a =
1) 1 2) 2 3) 3 4) 4

3. The domain of the function $f(x) = \sin^{-1}(x + [x])$ where [x] is the integral part of x
1) [–1 1] 2) $\left[-\frac{\pi}{2}\ \frac{\pi}{2}\right]$
3) [–1 2] 4) [0 1)

4. Let $f(x) = \frac{\alpha x}{x+1}$ (x ≠ –1) and $f(x) = f^{-1}(x)$ then α =
1) $\sqrt{2}$ 2) $-\sqrt{2}$ 3) 1 4) –1

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5. Set A has 3 elements and another set B has 6 elements then
1) 3 ≤ n(A∪B) ≤ 6 2) 3 ≤ n(A∪B) ≤ 8
3) 6 ≤ n(A∪B) ≤ 9 4) 0 ≤ n(A∪B) ≤ 9

6. If n(A) = 4, the number of symmetric relations that can be defined on A is
1) 2^{10} 2) 2^9 3) 2^{11} 4) 2^{17}

7. The number of arbitrary elements in a symmetric matrix of order 3 is
1) 3 2) 6 3) 9 4) 12

8. Let $A = \begin{pmatrix} 1 & \sin\theta & 1 \\ -\sin\theta & 1 & \sin\theta \\ -1 & -\sin\theta & 1 \end{pmatrix}$ where θ ∈ R then
1) |A| ∈ [–1 1] 2) |A| ∈ [0 1]
3) |A| ∈ [2 4] 4) |A| = 0

9. If A, B, C are three square matrices of same order so that $B = CAC^{-1}$ then CA^3C^{-1} =
1) B 2) B^2 3) B^3 4) B^4

10. If $u_n = \begin{vmatrix} 1 & K & K \\ 2n & K^2 + K + 1 & K^2 + K \\ 2n - 1 & K^2 & K^2 + K + 1 \end{vmatrix}$ and $\sum_{n=1}^{K} U_n = 72$ then K =
1) 8 2) 9 3) 6 4) 7

Numerical Value Type

11. If g(x) is a polynomial function satisfying g(x) g(y) = g(x) + g(y) + g(xy) – 2 all real x, y such that g(2) = 5 then g(1) =

12. Two finite set A and B have n and 4 elements respectively. The total number of relations from A To B are 240 more than the total number of relations from A to B. Then n =

13. If $\begin{vmatrix} 1 & 1 & 1 \\ {}^mc_1 & {}^{(m+3)}c_1 & {}^{(m+6)}c_1 \\ {}^mc_2 & {}^{(m+3)}c_2 & {}^{(m+6)}c_2 \end{vmatrix} = 2^{\alpha}.\ 3^{B}.\ 5^{\gamma}$ then α + β + γ =

Answers

1-3 2-3 3-4 4-4 5-3 6-1 7-2 8-3 9-3 10-1 11-2 12-2 13-3