

1. All letters of the word 'CEASE' are arranged randomly in a row then the probability that two E are found together is :

- (1) $\frac{7}{5}$ (2) $\frac{3}{5}$ (3) $\frac{2}{5}$ (4) $\frac{1}{5}$

2. Three numbers are selected randomly between 1 to 20. Then the probability that they are consecutive numbers will be :

- (1) $\frac{7}{190}$ (2) $\frac{3}{190}$ (3) $\frac{5}{190}$ (4) $\frac{1}{3}$

3. If the four positive integers are selected randomly from the set of positive integers then the probability that the number 1, 3, 7, 9 are in the unit place in the product of 4 digits selected is :

- (1) $\frac{7}{625}$ (2) $\frac{2}{5}$ (3) $\frac{5}{625}$ (4) $\frac{16}{625}$

4. If the position vectors of the vertices A, B, C are $\hat{6}i, \hat{6}j, \hat{k}$ respectively w.r.t. origin O then the volume of the tetrahedron OABC is :

- (1) 6 (2) 3 (3) $\frac{1}{6}$ (4) $\frac{1}{3}$

5. If three vectors $2\hat{i} - \hat{j} - \hat{k}, \hat{i} + 2\hat{j} - 3\hat{k}, 3\hat{i} + \hat{j} + 5\hat{k}$ are coplanar then the value of λ is :

- (1) -4 (2) -2 (3) -1 (4) 0

6. The vector perpendicular to the vectors $4\hat{i} - \hat{j} + 3\hat{k}$ and $-2\hat{i} + \hat{j} - 2\hat{k}$ whose magnitude is 9 :

- (1) $3\hat{i} + 6\hat{j} - 6\hat{k}$ (2) $3\hat{i} - 6\hat{j} + 6\hat{k}$ (3) $-3\hat{i} + 6\hat{j} + 6\hat{k}$ (4) none of these

7. The area of the region bounded by the curves $x^2 + y^2 = 8$ and $y^2 = 2x$ is :

- (1) $2\pi + \frac{1}{3}$ (2) $\pi + \frac{1}{3}$ (3) $2\pi + \frac{4}{3}$ (4) $\pi + \frac{4}{3}$

8. The value of $\int_0^{\pi} \log(1 + \cos x) dx$ is :

- (1) $-\frac{\pi}{2} \log 2$ (2) $\pi \log \frac{1}{2}$ (3) $\pi \log 2$ (4) $\frac{\pi}{2} \log 2$

9. The value of $\int_3^4 \sqrt{(4-x)(x-3)} dx$ is :

- (1) $\frac{\pi}{16}$ (2) $\frac{\pi}{8}$ (3) $\frac{\pi}{4}$ (4) $\frac{\pi}{2}$

10. The value of $\frac{dx}{x(x^n+1)}$ is :

(1) $\frac{1}{n} \log \left(\frac{x^n}{x^n+1} \right) + c$

(2) $\log \left(\frac{x^n+1}{x^n} \right) + c$

(3) $\frac{1}{n} \log \left(\frac{x^n+1}{x^n} \right)$

(4) $\log \left(\frac{x^n}{x^n+1} \right) + c$

11. The value of $\cos(\log x) dx$ is :

(1) $\frac{1}{2} [\sin(\log x) + \cos(\log x)] + c$

(2) $\frac{x}{2} [\sin(\log x) + \cos(\log x)] + c$

(3) $\frac{x}{2} [\sin(\log x) - \cos(\log x)] + c$

(4) $\frac{1}{2} [\sin(\log x) - \cos(\log x)] + c$

12. The value of $e^x \left(\frac{1+\sin x}{1+\cos x} \right) dx$ is :

(1) $\frac{1}{2} e^x \sec \frac{x}{2} + c$

(2) $e^x \sec \frac{x}{2} + c$

(3) $\frac{1}{2} e^x \tan \frac{x}{2} + c$

(4) $e^x \tan \frac{x}{2} + c$

13. The value of $\frac{1}{3 \sin x - \cos x + 3}$ is dx :

(1) $\tan^{-1} \left(\tan \frac{x}{2} + 1 \right) + c$

$$(2) \frac{1}{2} \tan^{-1} \left(2 \tan \frac{x}{2} + 1 \right) + c$$

$$(3) \tan^{-1} \left(2 \tan \frac{x}{2} + 1 \right) + c$$

$$(4) 2 \tan^{-1} \left(\tan \frac{x}{2} + 1 \right) + c$$

14. Divide 10 into two parts such that the sum of double of the first and the square of the second is minimum :

- (1) 6,4 (2) 7,3 (3) 8, 2 (4) 9,1

15.. The value of $\frac{\sin 2x \, dx}{\sin^4 x + \cos^4 x}$ is ;

- (1) $\tan^{-1}(\cot^2 x) + c$ (2) $\tan^{-1}(\cos^2 x) + c$
(3) $\tan^{-1}(\sin^2 x) + c$ (4) $\tan^{-1}(\tan^2 x) + c$

16. The value of $\int \sqrt{1 + \sec x} \, dx$ is :

- (1) $1 \sin^{-1}(\sqrt{2} \sin x) + c$
(2) $-2 \sin^{-1}(\sqrt{2} \sin x/2) + c$
(3) $2 \sin^{-1}(\sqrt{2} \sin x) + c$
(4) $2 \sin^{-1}(\sqrt{2}x/2) + c$

17. The value of $\int \frac{(x^2 + 1) \, dx}{x^4 + x^2 + 1}$ is :

$$(1) \frac{1}{\sqrt{3}} \tan^{-1} \left\{ \frac{x - 1/x}{\sqrt{3}} \right\} + c$$

$$(2) \frac{1}{2\sqrt{3}} \log \left\{ \frac{(x - 1/x) - \sqrt{3}}{(x - 1/x) + \sqrt{3}} \right\} + c$$

$$\left(\quad \right)$$

$$(3) \tan^{-1} \frac{x + 1/x}{\sqrt{3}} + c$$

$$(4) \tan^{-1} \left(\frac{x - 1/x}{\sqrt{3}} \right) + c$$

18. The value of $\int_0^1 x^2 (1-x^2)^{3/2} dx$ is :

- (1) $\frac{1}{32}$ (2) $\frac{\pi}{8}$ (3) $\frac{\pi}{16}$ (4) $\frac{\pi}{32}$

19. The value of $\int_0^{\infty} \frac{xdx}{(1+x)(x^2+1)}$ is :

- (1) 2π (2) π (3) $\frac{\pi}{16}$ (4) $\frac{\pi}{32}$

20. $y^2 = 8x$ and $y = x$

- (1) $\frac{64}{3}$ (2) $\frac{32}{3}$ (3) $\frac{16}{3}$ (4) $\frac{8}{3}$

21. If in a triangle ABC, O and O' are the incentre and orthocenter respectively then $(OA + OB + OC)$ is equal to :

- (1) $2O'O$ (2) $O'O$ (3) OO' (4) $2OO'$

22. If $\vec{a} + \vec{b} + \vec{c} = \vec{a}$ and $|\vec{a}| = 5$, $|\vec{b}| = 3$, $|\vec{c}| = 7$ then angle between \vec{a} and \vec{b} is :

- (1) $\frac{\pi}{2}$ (2) $\frac{\pi}{3}$ (3) $\frac{\pi}{4}$ (4) $\frac{\pi}{6}$

23. $i.(j \times k) + j.(k \times i) + k.(i \times j)$ is equal to :

- (1) 3 (2) 2 (3) 1 (4) 0

24. One card is drawn at random from a pack of playing cards the probability that it is an ace or black king or the queen of the heart will be :

- (1) $\frac{3}{52}$ (2) $\frac{7}{52}$ (3) $\frac{6}{52}$ (4) $\frac{1}{52}$

25. 15 coins are tossed then the probability of getting 10 heads tails will be :

- (1) $\frac{511}{32768}$ (2) $\frac{1001}{32768}$ (3) $\frac{3003}{32768}$ (4) $\frac{3005}{32768}$

26. The odds against solving a problem by A and B are 3 : 2 and 2 : 1 respectively then the probability that the problem will be solved is :

- (1) $\frac{3}{5}$ (2) $\frac{2}{15}$ (3) $\frac{2}{5}$ (4) $\frac{11}{15}$

27. The pole of the line $tx + my + n = 0$ w.r.t. the parabola $y^2 = 4ax$ will be :

- (1) $\left(\frac{-n}{1}, \frac{-2am}{1}\right)$ (2) $\left(\frac{-n}{1}, \frac{2am}{1}\right)$
(3) $\left(\frac{n}{1}, \frac{-2am}{1}\right)$ (4) $\left(\frac{n}{1}, \frac{2am}{1}\right)$

28. If $2x + y + \lambda = 0$ is normal to the parabola $y^2 = 8x$ then λ is :

- (1) -24 (2) $\neq 8$ (3) -16 (4) 24

29. If the line $tx + my + n = 0$ is tangent to the parabola $y^2 = 4ax$ then :

- (1) $mn = at^2$ (2) $tm = an^2$ (3) $tn = am^2$ (4) none of these

30. $f: \mathbb{R} \rightarrow \mathbb{R}$, $f(x) = x |x|$ will be :

- (1) many one onto (2) one one onto
(3) many are into (4) one one into

31. $\lim_{x \rightarrow \pi/2} (\sec x - \tan x)$ is equal to :

- (1) 2 (2) -1 (3) 1 (4) 0

32. If $f(x) = \begin{cases} \frac{\log(1+2ax) - \log(1-bx)}{x}, & x \neq 0 \\ K, & x = 0 \end{cases}$

Is continuous at $x = 0$ then value of K is :

- (1) $b + a$ (2) $b - 2a$ (3) $2a - b$ (4) $2a + b$

33. If $f(x) = |x - 3|$ then $f'(3)$ is :

- (1) -1 (2) 1 (3) 0 (4) does not exist

34. If $\tan x = \frac{2t}{1-t^2}$ and $\sin y = \frac{2t}{1+t^2}$ then the value of $\frac{dy}{dx}$ is :

- (1) 1 (2) t (3) $\frac{1}{1-t}$ (4) $\frac{1}{1+t}$

35. If $x^p + y^q = (x + y)^{p+q}$ then $\frac{dy}{dx}$ is :

- (1) $-\frac{x}{y}$ (2) $\frac{x}{y}$ (3) $-\frac{dx}{x}$ (4) $\frac{y}{x}$

36. All the points on the curve $y^2 = 4a[x + a \sin(\frac{x}{a})]$, where the stangent is parallel to the axis of x are lies on :

- (1) circle (2) parabola (3) stright line (4) none of these

37. The length of normal at any point to the curve $y = c \cos h(x/c)$ is :

- (1) fixed (2) $\frac{y^2}{c^2}$ (3) $\frac{y^2}{c}$ (4) $\frac{y}{c^2}$

38. The weight of right circular cylinder of maximum volume inscribed in a sphere of diameter 2a is:

- (1) $2\sqrt{3}a^3$ (2) $\sqrt{3}a^3$ (3) $\frac{2a}{\sqrt{3}}$ (4) $\frac{a}{\sqrt{3}}$

39. The intercept of the latus rectum to the parabola $y^2 = 4ax$ b and k then k is equal to :

- (1) $\frac{ab}{a-b}$ (2) $\frac{a}{b-a}$ (3) $\frac{b}{b-a}$ (4) $\frac{ab}{b-a}$

40. The equation of directrix to the parabola $4x^2 - 4x - 2y + 3 = 0$ will be :

- (1) $8y = 9$ (2) $8x = 9$ (3) $8y = 7$ (4) $8x = 7$

41. If $f(x) = \frac{2^x + 2^{-x}}{2}$ then $f(x+y)$, $f(x-y)$ is :

- (1) $\frac{1}{4}[f(2x) - f(2y)]$ (2) $\frac{1}{2}[f(2x) - f(2y)]$
 (3) $\frac{1}{4}[f(2x) + f(2y)]$ (4) $\frac{1}{2}[f(2x) + f(2y)]$

42. The period of $|\cos x|$ will be :

- (1) $\frac{\pi}{4}$ (2) $\frac{\pi}{2}$ (3) π (4) 2π

43. $\lim_{x \rightarrow 3} \left[\frac{3^x - 1}{x} \right]$ is equal to :

- (1) $2 \log 3$ (2) $3 \log 3$ (3) $\log 3$ (4) none of these

44. If $f(x) = \begin{cases} x \sin(1/x), & x \neq 0 \\ 0, & x = 0 \end{cases}$

at then at $x = 0$ the function $f(x)$ is :

- (1) differentiable (2) differentiable (3) continuous but not differentiable (4) none of these

45. Differential coefficient of $e^{\sin^{-1}x}$ w.r.t. $\sin^{-1}x$ is:

- (1) $\sin^{-1}x$ (2) $e^{\sin^{-1}x}$ (3) $e^{\cos^{-1}x}$ (4) $\cos^{-1}x$

46. If $y = \tan^{-1} \left\{ \frac{3a^2x - x^3}{a(a^2 - 3x^2)} \right\}$ then $\frac{dy}{dx}$ is:

(1) $\frac{3a^2}{a^2 + x^2}$ (2) $\frac{3a}{a^2 + x^2}$

(3) $\frac{a}{a^2 + x^2}$ (4) $\frac{3}{a^2 + x^2}$

47. The angle of intersection between $xy = a^2$, $x^2 + y^2 = 2a^2$ is:

- (1) 90° (2) 45° (3) 30° (4) 0°

48. The length of the subtangent to the curve $x^m y^n = a^{m+n}$ is proportional to:

- (1) $\frac{x^2}{y}$ (2) $\frac{y^2}{x}$ (3) y (4) x

49. The st. line $\frac{x}{a} + \frac{y}{b} = 2$ is tangent to the curve $\left(\frac{x}{a}\right)^n + \left(\frac{y}{b}\right)^n = 2$ at the point (a, b) then n is:

- (1) any real number (2) 3 (3) 2 (4) 1

50. If α, β are the roots of the equation $x^2 - 2x \cos \theta + 1 = 0$ then equation whose roots are $\alpha_{n/2}, \beta_{n/2}$ will be:

- (1) $x^2 - 2x \cos(n\theta) + 1 = 0$
(2) $x^2 - 2nx \cos(n\theta) + 1 = 0$
(3) $x^2 - 2x \cos(2n\theta) + 1 = 0$
(4) $x^2 - 2x \cos\left(\frac{n\theta}{2}\right) + 1 = 0$

51. 33th exponents of the eleventh roots of unity will be:

- (1) 1 (2) -11 (3) 0 (4) 11

52. If $\sin \alpha + \sin \beta + \sin \gamma = 0$ $\cos \alpha + \cos \beta + \cos \gamma$ then $\sin^2 \alpha + \sin^2 \beta + \sin^2 \gamma$ is equal to:

- (1) $\frac{2}{3}$ (2) $-\frac{3}{2}$ (3) $\frac{3}{2}$ (4) 0

53. $\sec^{-1}(1/2)$ is:

- (1) $\log(\sqrt{3} \pm \sqrt{2})$ (2) $\log(\sqrt{3} \pm 1)$ (3) $\log(2 \pm \sqrt{3})$ (4) none of these

54. The imaginary part of $(x + iy)$ is:

- (1) $\frac{1}{2} \cos h 2x \cos 2y$ (2) $\frac{1}{2} \cos 2x \cosh h 2y$
(3) $\frac{1}{2} \sin h 2x \sin 2y$ (4) $\frac{1}{2} \sin 2x \sin h 2y$

55. The image of the point $(-1, 2)$ in the st. line $x - 2y = 3$ is :

- (1) $\left(\frac{9}{5}, -\frac{23}{5}\right)$ (2) $\left(\frac{11}{5}, -\frac{22}{5}\right)$ (3) $\left(\frac{13}{5}, -\frac{21}{5}\right)$ (4) $(3, -4)$

56. The locus of the middle point of the intercept made by $x \cos \alpha + y \sin \alpha = p$ on axes is :

- (1) $x^2 + y^2 = p^2$ (2) $x^2 + y^2 = 4p^2$ (3) $x^2 + y^2 = p^2$ (4) $x^2 + y^2 = 4p^2$

57. The locus of the middle point of the chord of length $2t$ to the curve $x^2 + y^2 = a^2$ will be:

- (1) $x^2 + y^2 = a^2 t^2$
 (2) $2x^2 + 2y^2 = t + a^2$
 (3) $x^2 + y^2 = t^2 + a^2$
 (4) $2x^2 + 2y^2 = a^2 - t^2$

58. The equation of the circle whose diameter is common chord to the circles $x^2 + y^2 + 2ax + c = 0$ and $x^2 + y^2 + 2by + c = 0$ is:

(1) $x^2 + y^2 - \frac{2ab^2}{a^2 + b^2}x + \frac{2a^2by}{a^2 + b^2} + c = 0$

(2) $x^2 + y^2 - \frac{2ab^2}{a^2 + b^2}x - \frac{2a^2by}{a^2 + b^2} + c = 0$

(3) $x^2 + y^2 + \frac{2ab^2}{a^2 + b^2}x + \frac{2a^2by}{a^2 + b^2} + c = 0$

(4) $x^2 + y^2 + \frac{2ab^2}{a^2 + b^2}x - \frac{2a^2by}{a^2 + b^2} + c = 0$

59. If $(3, \lambda)$ and $(5, 6)$ are the conjugate points to the curve $x^2 + y^2 = 3$ then λ is :

- (1) -1 (2) 1 (3) -2 (4) 2

60. The equation of the pair of tangents at $(0, 1)$ to the circle $x^2 + y^2 - 2x - 6y + 6 = 0$ is:

- (1) $3(x^2 - y^2) + 4xy - 4x - 6y + 3 = 0$
 (2) $3y^2 + 4xy - 4x - 6y + 3 = 0$
 (3) $3x^2 + 4xy - 4x - 6y + 3 = 0$
 (4) $3(x^2 + y^2) + 4xy - 4x - 6y + 3 = 0$

61. The amplitude of $\left(\frac{1 + \cos \theta + i \sin \theta}{1 + \cos \theta - i \sin \theta}\right)^2$ is :

- (1) $-n\theta$ (2) $-\frac{n\theta}{2}$ (3) $\frac{n\theta}{2}$ (4) $n\theta$

62. The product of all roots of $\left(\frac{1}{2} + i\sqrt{\frac{3}{2}}\right)^{3/8}$ is:

- (1) 2 (2) -1 (3) 0 (4) 1

63. If $\cosh \alpha = \sec x$ then $\tan^2 x/2$ is :

- (1) $\cos 2(\alpha/2)$ (2) $\sin 2 \alpha/2$ (3) $\cot 2(\alpha/2)$ (4) $\tan h 2 \alpha/2$

64. The real part of the principle value of 2^{-1} is :

- (1) $\sin(\log 2)$ (2) $\cos(1/\log 2)$ (3) $\cos[\log(1/2)]$ (4) $\cos(\log 2)$

65. The two vertices of triangle are (2, -1), (3, 2) and the third vertex lies on $x + y = 5$. The area of the triangle is 4 units then the third vertex is :

- (1) (0,5) or (1,4) (2) (5, 0) or (4, 1) (3) (5, 0) or (1, 4) (4) (0, 5) or (4, 1)

66. If $2a + b + 3c = 0$ then the line $ax + by + c = 0$ passes through the fixed point that is:

- (1) $\left(\frac{2}{3}, \frac{1}{3}\right)$ (2) $\left(0, \frac{1}{3}\right)$ (3) $\left(\frac{2}{3}, 0\right)$ (4) none of these

67. Straight lines $ax \pm by \pm c = 0$ represent a :

- (1) Rhombus (2) Square (3) Rectangle (4) None of these

68. The equation of the circle passing through (2a, 0) and whose radical axis w.r.t. the circle $x^2 + y^2 = a^2$ is $x = \frac{a}{2}$ will be :

- (1) $x^2 + y^2 + 2ay = 0$
(2) $x^2 + y^2 + 2ax = 0$
(3) $x^2 + y^2 - 2ay = 0$
(4) $x^2 + y^2 - 2ax = 0$

69. The circles $x^2 + y^2 + 2ax + c = 0$ and $x^2 + y^2 + 2by + c = 0$ touches each other then:

- (1) $a^2 + b^2 = c^2$ (2) $\frac{1}{a^2} + \frac{1}{b^2} = \frac{1}{c^2}$ (3) $\frac{1}{a^2} + \frac{a}{b^2} = \frac{1}{c}$ (4) $\frac{1}{a^2} - \frac{1}{b^2} = \frac{1}{c}$

70. The pole of the polar w.r.t. the circle $x^2 + y^2 = c^2$ lies on $x^2 + y^2 = 9c^2$ then this polar is tangent to concentric circle whose equation will be :

- (1) $x^2 + y^2 = 4c^2$ (2) $x^2 + y^2 = \frac{c^2}{9}$ (3) $x^2 + y^2 = \frac{9c^2}{4}$ (4) none of these

71. In a G.P. $(m+n)^{\text{th}}$ term is a and $(m-n)^{\text{th}}$ term is 4 then mth term will be :

- (1) -6 (2) 1/6 (3) 6 (4) none of these

72. The sum of n terms of $\underline{1} + \underline{3} + \underline{7} + \underline{15} + \dots$ is :

- (1) $2n-2+2^n$ (2) $1-n+2^n$ (3) n^2-n (4) $n^{-1}+2-n$

73. If 10 points lie on a plane out of which 5 are on a st-line, then total number of triangles formed by them are :

- (1) 120 (2) 110 (3) 150 (4) 100

74. If $(1+x)^n = C_0 + C_1x + C_2x^2 + \dots + C_nx^n$ then value of $\frac{C_0}{2} + \frac{C_1}{3} + \frac{C_2}{4} + \dots +$

$$\frac{C_n}{n+2} \text{ is :}$$

- (1) $\frac{2^n+1}{(n+1)(n+2)}$ (2) $\frac{n2^{n+1}}{(n+1)(n+2)}$
 (3) $\frac{n2^{n+1}}{(n+1)(n+2)}$ (4) $\frac{n2^{n+1}}{(n+1)(n+2)}$

75. The square roots of $1 + 2x + 3x^2 + 4x^3 + \dots$ is :

- (1) $(1-x)^{-1}$ (2) $(1+x)$ (3) $1+x$ (4) $(1-x)$

76. If $(1+x)^n = C_0 + C_1x + C_2x^2 + \dots$ then $C_0 + \frac{C_1}{2} + \frac{C_2}{3} + \dots$:

- (1) $\frac{2^{n+1} + 1}{n + 1}$ (2) $\frac{2^{n-1}}{n - 1}$
 (3) $\frac{2^{n+1} + 1}{n + 1}$ (4) $\frac{2^{n+1}}{n + 1}$

$$77. \begin{vmatrix} 2ac - b^2 & a^2 & c^2 \\ ac^2 & 2ab - c^2 & b^2 \\ c^2 & b^2 & 2bc - a^2 \end{vmatrix}$$

- (1) $(a^3 + b^3 + c^3 - 3abc)^2$
 (2) $(a^2 + b^2 + c^2)^3$
 (3) $(ab + bc + ca)^3$
 (4) $(a + b + c)^6$

78. If for any two square matrices A and B, $AB = A$, $BA = B$ then A^2 :

- (1) B^2 (2) $\text{adj } A$ (3) B (4) A

79. If $A = \begin{pmatrix} 1 & 3 & 6 \\ 3 & 5 & 1 \\ 5 & 1 & 3 \end{pmatrix}$ then $\text{adj. } A$ is :

(1) $\begin{pmatrix} 14 & 4 & -22 \\ 4 & -22 & 14 \\ 22 & -14 & 4 \end{pmatrix}$

(2) $\begin{pmatrix} 14 & 4 & -22 \\ 4 & -22 & 14 \\ -22 & 14 & 4 \end{pmatrix}$

(3) $\begin{pmatrix} -14 & 4 & 22 \\ 4 & 22 & -14 \\ 22 & -14 & 4 \end{pmatrix}$

(4) $\begin{pmatrix} 14 & -4 & -22 \\ -4 & -22 & 14 \\ -22 & 14 & -4 \end{pmatrix}$

80. The A.M. of any two numbers is 16 and their H.M. = $\frac{63}{4}$ then their G.M. will be :

(1) $\sqrt{3}$ (2) $6\sqrt{3}$ (3) $\sqrt{7}$ (4) $6\sqrt{7}$

81. The sum of n terms of $1.2.3 + 2.3.4$ will be :

(1) $\frac{n(n+1)(n+2)(n+3)}{4}$

(2) $\frac{2n(n+1)(n+2)(n+3)}{3}$

(3) $\frac{(n+1)(n+2)(n+3)}{4}$

(4) $\frac{n(n-1)(n-2)(n-3)}{4}$

82. Out of 14 players there are 5 bowlers. Then the total number of ways of selecting a team of 11 players of which at least 4 are bowlers are :

(1) 275 (2) 264 (3) 263 (4) 265

83. If $(1+x)^n = C_0 + C_1x + C_2x^2 + \dots + C_n x^n$ then the value of $C_1 + 2C_2 + 3C_3 + 4C_4 + \dots + nC_n$ will be :

(1) 2^{n-1} (2) $n \cdot 2^{n-1}$ (3) 2^n (4) 0

84. If the coefficients of the second third and fourth terms in the expansion of $(1+x)^{2n}$ are in A.P. then $2n^2 - 9n$ is :

- (1) -14 (2) 14 (3) -7 (4) 7

85. If $\begin{vmatrix} a-b & -c \\ -a & b-c \\ -a & -b & c \end{vmatrix} + \lambda abc = 0$ then λ is :

- (1) -2 (2) 2 (3) 4 (4) -4

86. If $A = \begin{pmatrix} 2 & 3 \\ 1 & 2 \end{pmatrix}$ and $B = \begin{pmatrix} 1 & 2 \\ 3 & 3 \\ 2 & 4 \end{pmatrix}$ then :

(1) $BA = \begin{pmatrix} 4 & 7 \\ 9 & 15 \\ 8 & 14 \end{pmatrix}$ (2) $BA = \begin{pmatrix} 4 & 9 & 8 \\ 7 & 15 & 14 \end{pmatrix}$

(3) $AB = \begin{pmatrix} 8 & 15 & 12 \\ 4 & 9 & 10 \end{pmatrix}$ (4) $AB = \begin{pmatrix} 8 & 4 \\ 15 & 9 \\ 12 & 10 \end{pmatrix}$

87. If $A = \begin{pmatrix} 1 & k \\ 0 & 1 \end{pmatrix}$ then $A^n =$

(1) $\begin{pmatrix} n & nk \\ 0 & n \end{pmatrix}$ (2) $\begin{pmatrix} n & k^n \\ 0 & n \end{pmatrix}$

(3) $\begin{pmatrix} 1 & nk \\ 0 & 1 \end{pmatrix}$ (4) $\begin{pmatrix} 1 & k^n \\ 0 & 1 \end{pmatrix}$

88. $|(1-1)(1+2i)(2-3i)| =$

- (1)
- $\sqrt{130}$
- (2)
- $\sqrt{13}$
- (3) 130 (4) 13

89. $(a+b)(a\omega+b\omega^2)(a\omega^2+b\omega) =$

- (1)
- $6(a^2+b^3)$
- (2)
- $3(a^3+b^3)$
- (3)
- a^3+b^3
- (4) 0

90 If $|z - 2| > |z - 4|$ then the correct statement is :

- (1) $x > 3$ (2) $x > -3$ (3) $x < 1$ (4) $x > -1$

91. If α, β are the roots of the equation $x^2 - 5x - 3 = 0$ then the equation whose roots are

$\frac{1}{2\alpha - 3}, \frac{1}{2\beta - 3}$ will be :

- (1) $33x^2 + 4x + 1 = 0$ (2) $33x^2 - 4x - 1 = 0$
 (3) $33x^2 + 4x + 1 = 0$ (4) $33x^2 + 4x - 1 = 0$

92. If x is real then the values of

$\frac{x^2 + 14x + 9}{x^2 + 2x + 3}$ is :

- (1) $(-\infty, -5) \cup (4, \infty)$ (2) $[-5, 4]$ (3) $[-4, 5]$ (4) $[4, 5]$

93. The sum of numbers divisible by 7 and lies between 100 to 300 will be :

- (1) 5486 (2) 8588 (3) 5086 (4) 5586

94. The area of the triangle represent by $z, iz,$ and $z - iz$ will be :

- (1) $2z^2$ (2) z^2 (3) $\frac{z^2}{2}$ (4) 0

95. If $z = x + iy$ then $\bar{z}z + 2(x + \bar{z}) + c = 0$ will represent :

- (1) a point (2) parabola (3) st-line (4) circle

96. If $x = 2\sqrt{3}i$ then $x^4 + 4x^2 - 8x + 39$ is equal to :

- (1) -20 (2) -52 (3) $-20 + 16i\sqrt{3}$ (4) $20 + 16i\sqrt{3}$

97. If one root of the equation $2x^2 - bx + c = 0$ is square of the other then :

- (1) $b^2 - 4ac = 0$ (2) $ac(a + c + 3b) = b^3$
 (3) $ac = b^3$ (4) none of these

98. $(a - b)^2, (b - c)^2, (c - a)^2$ are in A.P. the $\frac{1}{a - b}, \frac{1}{b - c}, \frac{1}{c - a}$ will be :

- (1) in H.P. (2) in G.P. (3) in A.P. (4) none of these

99. If the first term of an infinite G.P. series is 1 and its every term is the sum of the next successive terms then fourth term will be :

- (1) $\frac{1}{16}$ (2) $\frac{1}{8}$ (3) $\frac{1}{4}$ (4) $\frac{1}{2}$

100. Correct statement is :

- (1) $(AB)^{-1} = B^{-1}A^{-1}$ (2) $(AB)^T = A^T B^T$ (3) $(AB)^{-1} = A^{-1}B^{-1}$ (4) none of these

