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MATHS – 1996

1. $\left(\frac{\cos\theta + \sin\theta}{\sin\theta + i\cos\theta}\right)^4$ **is equal to :**

(1) $\cos 8\theta + i \sin 8\theta$ (2) $\sin 8\theta - i \cos 8\theta$
(3) $\sin 8\theta - i \cos 8\theta$ (4) $\cos 8\theta - i \sin 8\theta$

2. If A = $\begin{pmatrix} 1 & -2 & 1 \\ 2 & 1 & 3 \end{pmatrix}$ **and B =** $\begin{pmatrix} 2 & 1 \\ 3 & 2 \\ 1 & 1 \end{pmatrix}$

then (AB)' is equal to :

(1) $\begin{pmatrix} 3 & 10 \\ 2 & 7 \end{pmatrix}$ (2) $\begin{pmatrix} -3 & 10 \\ -2 & 7 \end{pmatrix}$

(3) $\begin{pmatrix} 3 & 2 \\ 10 & 7 \end{pmatrix}$ (4) $\begin{pmatrix} -3 & -2 \\ 10 & 7 \end{pmatrix}$

3. If A = $\begin{pmatrix} 1 & 1 & 1 \\ 1 & 2 & -3 \\ 2 & -1 & 3 \end{pmatrix}$**, then adj is equal to :**

(1) $\begin{pmatrix} 3 & -9 & 5 \\ -4 & 1 & 3 \\ -5 & 4 & 1 \end{pmatrix}$ (2) $\begin{pmatrix} 3 & -4 & -5 \\ -9 & 3 & 4 \\ -5 & 3 & 1 \end{pmatrix}$

(3) $\begin{pmatrix} -3 & 4 & 5 \\ 9 & -4 & -1 \\ -3 & 4 & 1 \end{pmatrix}$ (4) $\begin{pmatrix} 3 & -9 & -5 \\ -4 & 1 & 3 \\ -5 & -1 & 1 \end{pmatrix}$

4. If A = $\begin{pmatrix} 1 & -2 \\ 3 & 0 \end{pmatrix}$**, B =** $\begin{pmatrix} -1 & 4 \\ 2 & 3 \end{pmatrix}$ **and ABC =** $\begin{pmatrix} 4 & 8 \\ 3 & 7 \end{pmatrix}$**, then matrix C is equal to :**

(1) $\begin{pmatrix} 54 & 110 \\ -3 & -11 \end{pmatrix}$ (2) $\frac{1}{66}\begin{pmatrix} -54 & -110 \\ 3 & 11 \end{pmatrix}$

(3) $\frac{1}{66}\begin{pmatrix} 54 & 110 \\ 3 & 11 \end{pmatrix}$ (4) none of these

5. The value of the determinant $\begin{vmatrix} \cos\alpha\cos & \sin\alpha & 0 \\ -\sin\alpha & \cos\alpha & 0 \\ 0 & 0 & 1 \end{vmatrix}$ **is :**

(1) – 1 (2) 0 (3) 1 (4) cos 2α

6. If ω is the cube root of unity then the value of $\begin{vmatrix} 1 & \omega & \omega^2 \\ \omega & \omega^2 & 1 \\ \omega^2 & 1 & \omega \end{vmatrix}$ **will be :**

(1) ω (2) $\omega^2 + 1$ (3) 0 (4) 1

7. If $(1 + x)^n = C_0 + c_1x + C_2x^2 + \ldots.. + C_nx^n$, **then** $C_0 + \frac{C_1}{2} + \frac{C_2}{3} + \ldots. + \frac{C_n}{n+1}$ **is equal to :**

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

8. If $(1 + x)^n = C_0 + C_1x + C_2x^2 + \ldots..C_nx^n$, **then** $C_0C_2 + C_1C_3 + C_2C_4 + \ldots. = C_{n-2}\,Cn$ **is equal to :**

(1) $\frac{2n}{n - 2\ n - 2}$ (2) $\frac{2n}{n\ n}$ (3) $\frac{2n}{n-2\ n + 2}$ (4) none of these

9. If the ratio of the second and third term in the expansion of $(a + b)^2$ **is equal to the ratio of third and fourth term in the expansion of** $(a + b)^{n+3}$ **then the value of n is equal to :**

(1) 6 (2) 4 (3) 5 (4) 3

10. The number of different words that can be formed by using the letters of the word 'MISSISIPI' is :

(1) 5067 (2) 6705 (3) 1520 (4) 2520

11. If a^2, b^2, c^2 **are in A.P. then** $\frac{1}{b + c^2}, \frac{1}{c + a}, \frac{1}{a + b}$ **will be :**

(1) in H.P. (2) in G.P. (3) in A.P. (4) in arithmetic geometrico progression

12. A bag coutains 5 white and 3 black balls. Two balls are drawn at random then the probability that out of the two one ball is red and other is black will be :

(1) $\frac{15}{56}$ (2) $\frac{11}{28}$ (3) $\frac{15}{28}$ (4) $\frac{2}{7}$

13. Two dice are thrown together then the probability that the sum of numbers appearing on the dice is 7 :

(1) $\frac{1}{6}$ (2) $\frac{1}{12}$ (3) $\frac{5}{36}$ (4) none of these

14. The position vectors of the two points A and B are a and b respectively then the position vector of the point C which divides AB in the ration 2 : 1 will be :

(1) $\frac{1 + b}{3}$ (2) $\frac{2a + b}{3}$ (3) $\frac{a + 2b}{3}$ (4) none of these

15. If $a + b = a - b$, then the angle between a and b will be :

(1) 180^0 (2) 90^0 (3) 60^0 (4) 0^0

16. The area of the region bounded by the curve $y = \sin^2 x$, x-axis and the lines $x = 0$, $x = \pi/2$ is

(1) π (2) $\pi/8$ (3) $\frac{\pi}{4}$ (4) $\frac{\pi}{2}$

17. $\int_0^{\pi/2} \frac{\sin x}{\sqrt{1 + \sin 2x}}\, dx$ **is equal to :**

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

18. $\int xe^x\, dx$ **is equal to :**

(1) $(x - 1)e^x + C$ (2) $(1 - x)e^x + C$
(3) $(1 - x)e^x + C$ (4) none of these

19. $\int x^2 \sin x^3\, dx$ **is equal to :**

(1) $\frac{1}{3}\sin x^3 + C$ (2) $-\frac{1}{3}\sin x^3 + C$
(3) $\frac{1}{3}\cos x^3 + C$ (4) $-\frac{1}{3}\cos x^3 + C$

20. The max. value of sin x + cos x :

(1) 1 (2) $\frac{1}{\sqrt{2}}$ (3) $\sqrt{2}$ (4) none of these

21. The angle between the curves $y = x$ and $y^2 = 4x$ at origin will be :

(1) 0 (2) $\frac{\pi}{3}$ (3) $\frac{\pi}{4}$ (4) none of these

22. If the volume of a balloon is increasing at the rate of 25 cm^3/sec., then if the radius of the balloon is 5 cm. then the rate of change of the surface are a is :

(1) 20 cm^2/sec. (2) 10 $mt.^2$/sec. (3) 5 $cm.^2$/sec. (4) 10 cm./sec.

23. The differential of coefficient of x^x is :

(1) $x^x \log_e x$ (2) $x^x (1 + \log_e x)$ (3) $x^x (1 – \log_e x)$ (4) none of these

24. $\frac{d}{dx}(\sin x)^{\tan x}$ is equal to :

(1) $(\sin x)^{\tan x} [1 – \sec^2 x \log \sin x]$
(2) $(\tan x)^{\sin x} \text{plog } \sec^2 x \log \sin x]$
(3) $(\sin x)^{\tan x} [1+ \sec^2 x \log \sin x]$
(4) none of these

25. If $y = \sec^{-1}\left(\frac{x+1}{x-1}\right) + \sin^{-1}\left(\frac{x-1}{x+1}\right)$ then $\frac{dy}{dx}$ is equal to :

(1) ∞ (2) 0 (3) 1 (4) –1

26. If $y = \sin^{-1}\left(\frac{2x}{1+x^2}\right)$, then $\frac{dy}{dx}$ is equal to :

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

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

27. If $x\sqrt{1+y} + y\sqrt{1+x} = 0$ then $\frac{dy}{dx}$ is equal to :

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

(3) $\frac{2}{(1+x)^2}$ (4) none of these

28. The continuous product of the roots of $(-1)^{2/3}$ is :

(1) ω^2 (2) ω (3) 0 (4) 1

29. The value of $\sin^{h-1} x$:

(1) $\log (x-\sqrt{x^2-1})$ (2) $\log (x+\sqrt{x^2-1})$

(3) $\log (x+\sqrt{x^2+1})$ (4) $\frac{1}{2}\log\frac{1+x}{1-x}$

30. The equation of a st-line passing through the point (1,2) and making equal angles to with axes, will be :

(1) x-y-2 = 0 (2) x+y+1 = 0 (3) x-y = 1 (4) x+y = 1

31. If the vertices of a parallelogram are (0,0), (2,1), (1,3) and (1,2) then the angle between their diagonals will be:

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

32. The equation of line which is parallel to the straight line 3x + 4y – 7 = 0 and passing through (1,2) is :

(1) 3x + 4y = 11 (2) 3x+4y+11= 0 (3) 4x-3y+2=0 (4) 3x+4y+7=0

33. The pole of the straight line 9x + y – 28 = 0 w.r.t. the circle $x^2 + y^2 = 16$ will be:

(1) $\left(\frac{33}{7}, \frac{3}{7}\right)$ (2) $\left(\frac{33}{7}, \frac{4}{7}\right)$

(3) $\left(\frac{4}{7}, \frac{36}{7}\right)$ (4) $\left(\frac{36}{7}, \frac{4}{7}\right)$

34. The equation of the tangent from origin to the circle $x^2 + y^2 – 2rx – 2hy + h^2 = 0$ is:

(1) $(h^2 – r^2)\, x + 2rhy = 0$
(2) $y = 0$
(3) $x – y = 0$
(4) $(h^2 – r^2)\, x – 2rhy = 0$

35. If a tangent at a point p to the parabola meets to the directrix at Q. If S is the focus of the parabola then $\angle PSQ$ is equal to :

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

36. If f(y) = log y, then f(y) + f(1/y) is equal to :

(1) 2 (2) 0 (3) –1 (4) 1

37. $\lim_{x\to 0}$ $\frac{e^x – \log (1 + x)}{x^2}$ is equal to :

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

38. If $\alpha\alpha$ and $\beta\beta$ are the roots of the equation $1 \quad (1 + n^2 + n^4) = 0$ then $\alpha\alpha^2 + \beta\beta^2$ is equal to :

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

39. The H.M. between 1 and $\frac{1}{16}$ will be :

(1) $\frac{17}{2}$ (2) $\frac{2}{17}$ (3) $\frac{17}{32}$ (4) $\frac{32}{17}$

40. If for two numbers G.M. is 4 and A.M. is 5, then H.M. will be :

(1) $\frac{25}{15}$ (2) $\frac{17}{8}$ (3) $\frac{16}{5}$ (4) $\frac{5}{16}$

41. If $^{10}C_r = {}^{10}C_{r+2}$ then ^5C_r is equal to :

(1) 360 (2) 120 (3) 10 (4) 5

42. The value of $1 + \frac{1}{4} + \frac{1.3}{4.8} + \frac{1.3.5}{4.8.12} + \ldots$ is :

(1) $\sqrt{(3/2)}$ (2) $\sqrt{2}$ (3) 2 (4) 3/2

43. If $(1+x)^n = C_0 + C_2x + C_2x^2 + \ldots + C_nx^n$ then $\frac{C_1}{C_o} + \frac{2C_2}{C_1} + \frac{3C_3}{C_2} + \ldots + \frac{nCn}{C_{n-1}}$ is equal to :

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

44. In the expansion of $\left(2^4 - \frac{1}{x^7}\right)$ the term independent of x is :

(1) – 32190 (2) 114050 (3) 42240 (4) 330

45. The value of the determent $\begin{vmatrix} 4 & -6 & 1 \\ -1 & -1 & 1 \\ -4 & 11 & -1 \end{vmatrix}$ is :

(1) θ (2) - 25 (3) 25 (4) none of these

46. If $\begin{vmatrix} 1 & 2 & 4 \\ 3 & 6+x & 7 \end{vmatrix} = 0$, then the value of x will be :

5 10 4+x

(1) 3 (2) 0 (3) 1 (4) none of these

47. If A = $\begin{pmatrix} d_1 & 0 & 0 \\ 0 & d_2 & 0 \\ 0 & 0 & d_3 \end{pmatrix}$ **then adj A =**

(1) $\begin{pmatrix} d_1^{-1} & 0 & 0 \\ 0 & d_2^{-1} & 0 \\ 0 & 0 & d_3^{-1} \end{pmatrix}$

(2) $\begin{pmatrix} d_2 d_3 & 0 & 0 \\ 0 & d_1 d_3 & 0 \\ 0 & 0 & d_1 d_2 \end{pmatrix}$

(3) $\begin{pmatrix} d_2 d_2 & 0 & 0 \\ 0 & d_1 d_3 & 0 \\ 0 & 0 & d_1 d_3 \end{pmatrix}$

(4) $\begin{pmatrix} d_1 d_3 & 0 & 0 \\ 0 & d_2 d_3 & 0 \\ 0 & 0 & d_1 d_2 \end{pmatrix}$

48. If A = $\begin{pmatrix} 2 & 4 \\ 0 & 3 \end{pmatrix}$ **and B =** $\begin{pmatrix} 1 & 2 \\ 0 & 5 \end{pmatrix}$ **, then 4A – 3B is equal to :**

(1) $\begin{pmatrix} 1 & 2 \\ 0 & 2 \end{pmatrix}$ (2) $\begin{pmatrix} -5 & -10 \\ 0 & 3 \end{pmatrix}$ (3) B= $\begin{pmatrix} 5 & 10 \\ 0 & -3 \end{pmatrix}$ (4)A= $\begin{pmatrix} 7 & 14 \\ 0 & 7 \end{pmatrix}$

49. If A = $\begin{pmatrix} \cos x & \sin x \\ -\sin x & \cos x \end{pmatrix}$ **, then A^{-1} is equal to :**

(1) $\begin{pmatrix} \cos x & \sin x \\ \sin x & \cos x \end{pmatrix}$ (2) $\begin{pmatrix} \cos x & -\sin x \\ \sin x & \cos x \end{pmatrix}$ (3) $\begin{pmatrix} \cos x & \sin x \\ -\sin x & \cos x \end{pmatrix}$ (4) none of these

50. A card is drawn at random from a pack of playing cards. The probability that it is red or an ace, is :

(1) $\frac{1}{13}$ (2) $\frac{1}{52}$ (3) $\frac{17}{52}$ (4) $\frac{4}{13}$

51. If the sum of two unit vector is also a unit vector then the magnitude of their difference will be :

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

52. The unit vector perpendicular to the vectors 6i + 2j + 3k and 3i – 6j – 2k will be:

(1) $\frac{2i - 3j - 6k}{7}$ (2) $\frac{2i - 3j + 6k}{7}$ (3) $\frac{2i + 3j = 6k}{7}$ (4) $\frac{2i + 3j + 6k}{7}$

53. The area of the region bounded by the curves $y^2 = 4ax$, x = 0 and x = a is

(1) $4\pi a^2$ (2) $3\pi a^2$ (3) $2\pi a^2$ (4) πa^2

54. The area of the region bounded by the curves $y^2 = 4ax$, x = 0 and x = a is :

(1) $\frac{5}{3} a^2$ (2) $\frac{2}{3} a^2$ (3) $\frac{8}{3} a^2$ (4) $\frac{4}{3} a^2$

55. $\int \cos^3 x \, dx$ is equal to

(1) $\frac{\sin 3x}{4} + 3 \sin x + C$

(2) $\frac{\sin 3x}{3} + \frac{\sin x}{2} + C$

(3) $\sin 3x + C$

(4) $\frac{\sin 3x}{12} + \frac{3}{4} \sin x + C$

56. If x = a (t+sin t) and y = a(1 – cos t) then $\frac{dy}{dx}$ is equal to :

(1) tan t (2) tan 2t (3) cot (t/2) (4) tan (t/2)

57. If $x = t^2$ and y = 2t, then the normal at t = 1 is :

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

58. $f(x) = 2x^3 - 9x^2 + 12x + 29$ is a monotonic decreasing function when :

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

59. The height of the cylinder of maximum volume that can be inscribed in a sphere of radius r is :

(1) $2\sqrt{3r}$ (2) $\frac{2r}{\sqrt{3}}$ (3) $r\sqrt{3}$ (4) $\frac{r}{\sqrt{3}}$

60. $\sec x \, dx$ is equal to :

(1) $\log \sin x + C$
(2) $\log \tan (x/2) + C$
(3) $-\log (\sec x - \tan x) + C$
(4) $\log \tan \left(\frac{\pi}{2} + \frac{\pi}{4} \right) + C$

61. The differential coefficient of $\sin^{-1}\left(\frac{1 - x^2}{1 + x^2}\right)$ w.r.t. x is :

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

62. $d(\sec^{-1} x)$ is equal to :

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

63. The differential coefficient of $\tan^{-1}\sqrt{\frac{1 - x^2}{1 + x^2}}$ w.r.t. is :

(1) ½ (2) 1 (3) – ½ (4) none of these

64. $\lim_{x \to 0} \frac{\tan 2x - x}{3x - \sin x}$ is equal to :

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

65. The differential coefficient of $\sin^{-1} x$ w.r.t. $\cos^{-1}\sqrt{1 - x^2}$ is :

(1) $-\frac{1}{\sqrt{1 + x^2}}$ (2) $\frac{1}{\sqrt{1 - x^2}}$ (3) $\frac{2}{\sqrt{1 - x^3}}$ (4) none of these

66. The sum of 20 terms of the series $1 + 4 + 7 + 10 + \ldots$ is :

(1) 290 (2) 490 (3) 590 (4) none of these

67. Which terms of the series $\frac{1}{2}, \frac{-1}{2}$, 1- 2, …. Is – 128 :

(1) 10^{th} (2) 8^{th} (3) 9^{th} (4) 12^{th}

68. If $^nP_4 : {}^nP_5 = 1 : 2$, then n is equal to :

(1) 2 (2) 4 (3) 5 (4) 6

69. $\frac{(\cos 3\theta + i \sin 3\theta)^5 (\cos 2\theta + i \sin 2\theta)^4}{(\cos \theta + i \sin \theta)^{-4} (\cos \theta + i \sin \theta)^6}$ is equal to :

(1) cos 27θ - i sin 27θ
(2) cos 33θ - i sin 33θ
(3) cos 33θ + i sin 33θ
(4) cos 27θ + i sin 27θ

70. The value of $\cos h^{-1} x$ is :

(1) $\log (x - \sqrt{x^2 - 1})$ (2) $\log (x + \sqrt{x^2 - 1})$

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

71. Find the equation of the straight line which is perpendicular to the line $\frac{x}{a} - \frac{y}{b} = 1$ and passes through the point where the given st-line cuts the x-axis :

(1) $ax + by = a^2$ (2) $ax – by = a^2$ (3) $ax + by = b^2$ (4) $bx – ay = ab$

72. If the lines x + y = 1, 2x – y = 0 and x + 2y + λ = 0 are concurrent then λ is equal to :

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

73. If two vertices of a triangle are (6,4), (2,6) and its centroid is (4, 6) then its theird vertex will be :

(1) (6,4) (2) (8,4) (3) (4,8) (4) none of these

74. The radical axis of the circles $2x^2 + 2y^2 – 7x = 0$ and $x^2 + y^2 – 4y – 7 = 0$ is :

(1) 8x – 7y + 14 = 0 (2) 7x – 8y + 14 = 0
(3) 7x – 8y – 14 = 0 (4) 7x + 8y + 14 = 0

75. The equation of the polar line w.r.t. the pole (1, - 2) to the arile $x^2 + y^2 – 2x – 6y + 5 = 0$ is :

(1) x + y – 1 = 0 (2) x + y + 1 = 0 (3) y = 2 (4) x = 2

76. The vertex of the parabola x2 – y + 6x + 10 = 0 is :

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

77. If $f(\theta) = \tan\theta$, then the value of $\frac{f(\theta) - f(\phi)}{1 + f(\theta) f(\phi)}$ is :

(1) $\theta - \phi$ (2) $f(\theta / \phi)$ (3) $f(\theta - \phi)$ (4) $f(\theta + \phi)$

78. $\lim_{x \to 0} \frac{x^2 - 3x + 2}{2x^2 + x - 3}$ is equal to :

(1) 0 (2) 2 (3) ½ (4) ∞

79. $\lim_{x \to 0} \left(\frac{\sqrt{1 + x} - \sqrt{1 - x}}{x} \right)$ is equal to :

(1) – 1 (2) 1 (3) 2 (4) ½

80. The equation of the normal at a point of intersection of line $2x + y = 3$ and curve $yx^2 + y^2 = 5$ is :

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

81. If $f(x) = \frac{x - 3}{x + 1}$, then $f[f\{f(x)\}]$ is equal to :

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

82. The modules of $\frac{1 + i}{1 - i}$ is :

(1) $\sqrt{2}$ (2) 2 (3) ½ (4) 1

83. The value of $\frac{4\sqrt{\sqrt{3}}}{7} - \frac{\sqrt{\sqrt{3}}}{7}$ is

(1) $\frac{3\sqrt{3}}{7}$ (2)- $\frac{3\sqrt{3}}{7}$ (3) $\frac{3\sqrt{3}}{7}$ i (4) none of these

84. $\frac{1 - 2i}{2 + i} + \frac{4 - i}{3 + 2i}$ is equal to :

(1) $\frac{10}{13} + \frac{24}{13}$ i (2) $\frac{10}{13} - \frac{24}{13}$ i (3) $\frac{24}{13} - \frac{10}{13}$ i (4) $\frac{24}{13} + \frac{10}{13}$ i

85. If $z = 5 + 3i$ then the value of $|z - 2|$ will be :

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

86. The imaginary part of $\frac{1-i}{1+i}$ is :

(1) – i (2) – 1 (3) 1 (4) i

87. If $z_1 = 1 + 2i$ and $z_2 = i - 1$, then z_1/z_2 is equal to :

(1) $\frac{1}{2} - \frac{3}{2}i$ (2) $-\frac{1}{2} + \frac{3}{2}$ (3) $\frac{1}{2} - \frac{3}{2}i$ (4) none of these

88. The amplitude of $1 - \sqrt{3}i$ is :

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

89. If α and β are the roots of the equation $x^2 + px + q = 0$ then the value of $\alpha^3 + \beta^3 = 0$ will be :

(1) $p^3 - 3pq$ (2) $-(p^3 + 3pq)$ (3) $p^3 + 3pq$ (4) $-p^3 + 3pq$

90. If α and β are the roots of the equation whose roots are $\frac{1}{\alpha}, \frac{1}{\beta}$ is :

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

91. If $z = \frac{(1+i)(2+i)}{3+i}$ then $|z|$ is equal to :

(1) – ½ (2) ½ (3) 1 (4) – 1

92. The slope of the tangent to the parabola $y^2 = 4ax$ point $(at^2, 2at)$ will be :

(1) – t (2) – 1/t (3) 1/t (4) t

93. If $a = i - 2j$ and $b = 2i + \lambda j$ are the parallel vectors then λ is equal to :

(1) – 2 (2) 2 (3) – 4 (4) 4

94. A stone is thrown in silent water, the ripples are moving at the rate of 6 cm0/sec. then the rate of change of the are when the radius of the unite is 10 cm. at the time when radius of the circle is 10 cm, then the rate at which its area increases is :

(1) 120 m^2/sec. (2) π cm^2/ sec. (3) 120 cm^2/sec. (4) 120 π cm^2/sec.

95. A dice is thrown then the probability that the sum of the number is 1 or 6 is :

(1) 1/6 (2) 1/3 (3) 2/3 (4) ¾

96. The value of cos h (πi) is :

(1) 0 (2) 1 (3) – 1 (4) none of these

97. For $Z_1, Z_2 \in C$ the value of $|Z_1 + Z_2|^2 + |Z_1 - Z_2|^2$ will be :

(1) $2(|Z_1|^2 + |Z_2|^2)$ (2) $|Z_1|^2 + |Z_2|^2$ (3) $|Z_1|^2 + |Z_2|^2 - |Z_1| - |Z_2|$ (4) $2(|Z_1|^2 - |Z_2|^2)$

98. The real part of cos h (αα iββis :

(1) sin hα cos β (2) cos hα cos β (3) –cos hα cos β (4) sin α cos β

99. If three vertices of a square are 3i, 1 + i and 3 + 2i then its fourth vertex will be :

(1) (3,3) (2) (2,4) (3) aigin (4) $\left(\frac{1}{2}, \frac{1}{2}\right)$

100. $\lim_{x \to b} \frac{|x - b|}{x - b}$ **is equal to :**

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

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1.(1)	2.(2)	3.(2)	4.(2)	5.(3)	6.(3)	7.(4)	8.(3)	9.(4)	10.(4)	11.(3)
12.(3)	13.(1)	14.(3)	15.(2)	16.(3)	17.(3)	18.(1)	19.(4)	20.(3)	21.(3)	22.(4)
23.(2)	24.(3)	25.(2)	26.(3)	27.(2)	28.(4)	29.(3)	30.(2)	31.(3)	32.(3)	33.(4)
34.(4)	35.(2)	36.(2)	37.(3)	38.(2)	39.(2)	40.(3)	41.(4)	42.(2)	43.(1)	44.(3)
45.(2)	46.(2)	47.(2)	48.(3)	49.(2)	50.(4)	51.(2)	52.(3)	53.(4)	54.(3)	55.(4)
56.(4)	57.(1)	58.(1)	59.(2)	60.(3)	61.(1)	62.(3)	63.(1)	64.(4)	65.(3)	66.(3)
67.(1)	68.(4)	69.(3)	70.(2)	71.(1)	72.(3)	73.(3)	74.(3)	75.(3)	76.(4)	77.(3)
78.(3)	79.(2)	80.(3)	81.(4)	82.(4)	83.(3)	84.(2)	85.(3)	86.(2)	87.(3)	88.(2)
89.(4)	90.(1)	91.(3)	92.(3)	93.(3)	94.(4)	95.(2)	96.(3)	97.(1)	98.(2)	99.(2)
100(4)										