



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  $\hat{6i}$ ,  $\hat{6j}$ ,  $\hat{k}$  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  $2\hat{i} - \hat{j} - \hat{k}$ ,  $\hat{i} + 2\hat{j} - 3\hat{k}$ ,  $3\hat{i} + \lambda\hat{j} + 5\hat{k}$  are coplanar then the value of  $\lambda$  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  $-\hat{2i} + \hat{j} - 2\hat{k}$  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  $\int \frac{dx}{x(x^n + 1)}$  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  $\int \cos(\log x) dx$  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  $\int e^x \left( \frac{1 + \sin x}{1 + \cos x} \right) dx$  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  $\int \frac{1}{3 \sin x - \cos x + 3} dx$  is :

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

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

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

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

**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  $\frac{(x^2 + 1) \, dx}{x^4 + x^2 + 1}$  is :**

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

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

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(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)  $2\pi$       (2)  $\pi$       (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)  $\vec{OO'}$       (2)  $\vec{O'O}$       (3)  $\vec{OO'}$       (4)  $2\vec{OO'}$

22. If  $\vec{a} + \vec{b} + \vec{c} = \vec{0}$  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.  $\vec{i} \cdot (\vec{j} \times \vec{k}) + \vec{j} \cdot (\vec{k} \times \vec{i}) + \vec{k} \cdot (\vec{j} \times \vec{i})$  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  $lx + my + n = 0$  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  $\lambda$  is :

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

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

- (1)  $mn = a^2$       (2)  $lm = an^2$       (3)  $ln = am^2$       (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)  $-\frac{y}{x}$       (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)  $2\sqrt{3a}$       (2)  $\sqrt{3a}$       (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 directris 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  $f(x+y) \cdot f(x-y)$  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)  $\pi$       (4)  $2\pi$

43.  $\lim_{x \rightarrow} \left( \frac{3^x - 1}{x} \right)$  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)  $e \cos^{-1}$                       (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)  $90^\circ$                       (2)  $45^\circ$                       (3)  $30^\circ$                       (4)  $0^\circ$

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

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

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  $\alpha, \beta$  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.  $\sec h^{-1} (1/2)$  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  $\lambda$  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  $\left(\frac{1}{2} + i \frac{\sqrt{3}}{2}\right)^{3/8}$  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  $2^{-i}$  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  $2a + b + 3c = 0$  than 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.  $(m + n)^{\text{th}}$  the 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 :**

2      4      8      16

- (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  $\frac{C_0}{2} + \frac{C_1}{3} + \frac{C_2}{4} + \dots +$**

**$\frac{C_n}{n+2}$  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  $\lambda$  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.  $|(1-i)(1+2i)(2-3i)| =$

- (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  $\alpha, \beta$  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

