

1. The equation of the normal to the circle  $x^2 + y^2 = a^2$  at point  $(x' y')$  will be :

- (1)  $x'y - xy' = 0$       (2)  $xx' - yy' = 0$   
(3)  $x'y + xy' = 0$       (4)  $xx' + yy' = 0$

2. Equation of the bisector of the acute angle between lines  $3x + 4y + 5 = 0$  and  $12x - 5y - 7 = 0$  is :

- (1)  $21x + 77y + 100 = 0$   
(2)  $99x - 27y + 30 = 0$   
(3)  $99x + 27y + 30 = 0$   
(4)  $21x - 77y - 100 = 0$

3. Equation to the line passing through the point  $(-4,5)$  and perpendicular to  $3x = 4y = 7$  :

- (1)  $3x-4y+32=0$       (2)  $4x+3y+1=0$   
(3)  $3x+4y-8=0$       (4)  $4x-3y+31=0$

4. If  $\theta$  is the angle between two straight lines represented by  $ax^2 + 2hxy + by^2 = 0$  then :

- (1)  $\tan \theta = \frac{2\sqrt{h^2 + ab}}{a + b}$   
(2)  $\cos \theta = \frac{2\sqrt{h^2 - ab}}{a + b}$   
(3)  $\tan \theta = \frac{\sqrt{h^2 - ab}}{a + b}$   
(4)  $\tan \theta = \frac{2\sqrt{h^2 - ab}}{a + b}$

5. The real part of  $\cos h (\alpha + i\beta)$  :

- (1)  $\sin \alpha \sin h\beta$       (2)  $\cos \alpha \cos h\beta$   
(3)  $2 \cos n\theta$       (4)  $\cos h\alpha \cos \beta$

6. If  $z = \cos \theta + i \sin \theta$ , then the value of  $z^n + \frac{1}{z^n}$  will be :

- (1)  $\sin 2n\theta$       (2)  $2 \sin n\theta$       (3)  $2 \cos n\theta$       (4)  $\cos 2n\theta$

7. If  $\alpha$  and  $\beta$  are the roots of the equation  $x^2 - 2x + 4 = 0$  then the value of  $\alpha^n + \beta^n$  will be :

- (1)  $i2^{n+1} \sin (n\pi/3)$       (2)  $2^{n+1} \cos (n\pi/3)$   
(3)  $i2^{n-1} \sin (n\pi/3)$       (4)  $2^{n-1} \cos (n\pi/3)$

8.  $[\sin (\alpha + \theta) - e^{ai} \sin \theta]^n$  is equal to :

- (1)  $\cos^n \alpha e^{in\theta}$       (2)  $\sin^n \alpha e^{in\theta}$   
(3)  $\cos^n \alpha e^{-in\theta}$       (4)  $\sin^n \alpha e^{-in\theta}$

9. If A is a skew symmetric matrix of second order and C is a column matrix of second order then CAC is equal to :

- (1) [0]            (2) [1]            (3)  $\begin{pmatrix} 0 & 1 \\ 1 & 0 \end{pmatrix}$             (4)  $\begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix}$

10. If  $A = \begin{pmatrix} 3 & 1 \\ -1 & 2 \end{pmatrix}$  and  $I = \begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix}$  then the correct statement is :

then the correct statement is :

- (1)  $A^2+5A - 7I = 0$   
 (2)  $-A^2+5A+7I=0$   
 (3)  $A^2-5A+7I = 0$   
 (4)  $A^2+5A+7I = 0$

11. If A and B are the two matrices of the same order and  $A^2-b^2 = (A+B)(A-B)$ , then the correct statement will be :

- (1)  $A'B' = AB$             (2)  $AB=BA$             (3)  $A^2+B^2 = A^2-B^2$             (4) none of these

12. The value of the determinant  $\begin{vmatrix} a-b-c & 2a & 2a \\ 2b & b-c-a & 2b \\ 2c & 2c & c-a-b \end{vmatrix}$  will be :

- (1)  $(a-b-c)(a^2+b^2+c^2)$     (2)  $(a+b+c)^3$     (3)  $(a+b+c)(ab+bc+ca)$     (4) none of these

13. If  $(1+x)^n = C_0 + C_1x + C_2x^2 + \dots + C_nx^n$ , then  $C_0-C_1+C_2-C_3+\dots+(-1)^n C_n$  is equal to:

- (1)  $3^n$             (2)  $2^n$             (3) 1            (4) 0

14. The term independent of x in the expansion  $\left(x + \frac{1}{x}\right)^{2n}$  is :

- (1)  $\frac{1.3.5\dots(2n-1)}{n!} \cdot 2^{n-1}$   
 (2)  $\frac{1.3.5\dots(2n-1)}{n!} \cdot 2^n$   
 (3)  $a.3.5\dots(2n-1) \cdot 2^n$   
 (4) none of these

15.  $(1-x)^3$  is equal to :

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

16. If  $n \in \mathbb{N}$ , then  $\sum_{m=1}^n m^2$  is equal to :

- (1)  $\frac{m(m+1)(2m+1)}{6}$

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(2)  $\frac{n(n-1)(2n-1)}{6}$

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

(4)  $\frac{n(n+1)(2n+1)}{6}$

17. If A.M. and H.M. between two numbers are 27 and 12 respectively then their G.M. is:

- (1) 9                      (2) 18                      (3) 24                      (4) 36

18. If  $\frac{1}{q+r}$ ,  $\frac{1}{r+p}$ ,  $\frac{1}{p+q}$ , are in A.P. then :

- (1)  $p^2, q^2, r^2$  are in A.P.  
(2)  $p, q, r$  are in A.P.  
(3)  $p, q, r$  are in G.P.  
(4)  $\frac{1}{p}, \frac{1}{q}, \frac{1}{r}$  are in A.P.

19. If  $\alpha$  and  $\beta$  are the roots of the equation  $x^2 - ax + b = 0$  and  $v_n = \alpha^n + \beta^n$  then :

- (1)  $v_{n+1} = av_n + bv_{n-1}$   
(2)  $v_{n+1} = bv_n - av_{n-1}$   
(3)  $v^{n+1} = av_n - bv_{n-1}$   
(4)  $v^{n+1} = bv_n + av_{n-1}$

20. If  $\alpha$  and  $\frac{1}{\alpha}$  are the roots of the equation  $5x^2 + 13x + k = 0$  then k will be:

- (1) 5                      (2) -5                      (3) 13                      (4) 1

21. The value  $i^3 - i^5 - i^{10} - i^{16}$  will be :

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

22. A coin tossed  $m + n$  ( $m > n$ ), times then the probability that the head appears  $m$  times continuously is :

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

23. For any two events A and B if  $P(A \cup B) = 5/6$ ,  $P(A \cap B) = 1/3$ ,  $P(B) = 1/2$  then  $P(A)$  is :

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

24. If M and N are any two events, then the probability of happening exactly one event is:

- (1)  $P(M) + P(N) - P(MN)$   
(2)  $P(M) + P(N) - 2P(MN)$   
(3)  $P(M) + P(N) + 2P(MN)$

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(4) none of these

25. A bag contains 3 white and 5 black balls. One ball is drawn at random. Then the probability that it is black is :

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

26. A box contains 100 bulbs, out of these 10 are used. 5 bulbs are chosen at random. Then the probability that no one is fused is :

- (1)  $\left(\frac{9}{10}\right)^5$       (2)  $\frac{{}^{90}C_5}{{}^{100}C_5}$       (3)  $\left(\frac{1}{2}\right)^5$       (4)  $10^{-5}$

27. For any two events A and B the correct statement is :

- (1)  $P(A \cap B) \leq P(A) + P(B)$   
(2)  $P(A \cap B) \leq P(A) + P(B) - 1$   
(3)  $P(A \cap B) \geq P(A) + P(B) - 1$   
(4)  $P(A \cap B) \geq P(A) + P(B)$

→

28. For any non zero vector **a** the correct statement is :

- →      → →      → →      → →  
(1)  $a \cdot a \leq 0$     (2)  $a \cdot a = 0$     (3)  $a \cdot a > 0$     (4)  $a \cdot a \geq 0$

→ → →

29.  $a \cdot (b \times c) = 0$  then the correct statement is :

- → →  
(1) out of a, b, c any two vectors are parallel  
→ → →  
(2) a, b, c are coplanar  
→ → →  
(3) any two are equal a, b, c  
(4) at least one above statement is correct

→ →      →      →

30. If  $A \times B = 0$  where **A** and **B** are non zero vectors then :

- →  
(1) **A** and **B** are perpendicular to each other  
→      →  
(2) the angle between **A** and **B** is  $\pi$   
→      →  
(3) **A** and **B** parallel vectors  
→  
(4) **B** is unit vector

^ ^ ^      ^ ^ ^

31. If  $2\mathbf{i} + \mathbf{j} - \mathbf{k}$  and  $\mathbf{i} - 4\mathbf{j} + \lambda\mathbf{k}$  are perpendicular to each other then  $\lambda$  is equal to:

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

32. If  $\frac{d}{dx} \phi(x) = f(x)$  then  $\int_1^2 f(x) dx$  is equal to :

- (1)  $f(1) - f(2)$             (2)  $\phi(1) - \phi(2)$             (3)  $f(2) - f(1)$             (4)  $\phi(2) - \phi(1)$

33. If  $f(a - x) = f(x)$ , then  $\int_0^a xf(x) dx$  is equal to :

- (1)  $\int_0^a f(x) dx$             (2)  $a \int_0^{a/2} f(x) dx$             (3)  $\int_0^a f(x) dx$             (4) none of these

34.  $\int_{-a}^a f(x) dx = 2 \int_0^a f(x) dx$  when :

- (1)  $f(2a-x) = -fx$             (2)  $f(2a-x) = f(x)$             (3)  $f(-x) = -f(x)$             (4)  $f(-x) = f(x)$

35.  $\int_0^2 |1 - x| dx$  is equal to :

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

36. For any integer n the value of  $\int_0^\pi e^{\cos^2 x} \cos^3(2n+1)x dx$  will be:

- (1)  $e^2$             (2) 0            (3) 1            (4) e

37.  $\frac{\sin 2x}{\sin^4 x + \cos^4 x} dx$  is equal to :

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

38.  $\frac{1}{x^5} dx$  is equal to :

- (1)  $-\frac{1}{5x^4} + C$             (2)  $-\frac{1}{5x^6} + C$             (3)  $-\frac{1}{4x^4} + C$             (4)  $-\frac{5}{x^6} + C$

39. The function  $\sin x + \cos x$  is maximum when  $x$  is equal to :

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

40. If the normal to a curve is parallel to axis of  $x$ , then the correct statement is :

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

41.  $\frac{d}{dx} \sin^{-1} x$  is equal to :

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

42. The differential coefficient of  $e^{x^3}$  is :

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

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

- (1)  $x^x \log (e/x)$             (2)  $x^x \log ex$             (3)  $\log ex$             (4)  $x^x \log x$

44.  $\lim_{x \rightarrow a} [f(x), g(x)]$  will exist, when :

- (1)  $\lim_{x \rightarrow a} \frac{f(x)}{g(x)}$  is exists  
(2)  $\lim_{x \rightarrow a} [f(x)]^{g(x)}$  is exists  
(3)  $\lim_{x \rightarrow a} f(x)$  or  $\lim_{x \rightarrow a} g(x)$  is exists  
(4)  $\lim_{x \rightarrow a} f(x)$  and  $\lim_{x \rightarrow a} g(x)$  both exists

45.  $\lim_{x \rightarrow 0} \frac{\sin x}{x}$  is equal to :

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

46. If  $f(x) = \sin [x]$ ,  $[x] \neq 0$  where  $[x]$  is a greatest integer less or equal to  $x$  then  $\lim_{x \rightarrow 0} f(x)$  is equal to :

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

47. If  $A = \{-2, -1, 0, 1, 2\}$  and  $f:A \rightarrow \mathbb{R}$  such that  $f(x) = x^2 + 1$ , then the range of  $f$  will be:

- (1)  $\{1, \pm 2, \pm 5\}$       (2)  $\{1, 2, 5\}$       (3)  $\{-2, -1, 0, 1, 2\}$       (4) none of these

48. The point  $(3, 2)$  will lie on the curve :

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

49. The diameter of the circle  $x^2 + y^2 + 4x - 6y = 0$ , is :

- (1)  $\sqrt{52}$       (2)  $\sqrt{13}$       (3)  $\sqrt{26}$       (4)  $\sqrt{20}$

50. The pole of the line  $mx + ny + p = 0$  w.r.t. the circle  $x^2 + y^2 = a^2$  is :

(1)  $\left(-\frac{n}{m} a^2, -\frac{m}{n} a^2\right)$

(2)  $\left(-\frac{a}{na^2}, \frac{m}{ma^2}\right)$

(3)  $\left(-\frac{1}{n} a^2, \frac{m}{n} a^2\right)$

(4)  $\left(\frac{1}{n} a^2, -\frac{m}{n} a^2\right)$

51. Two dice thrown together then the probability of getting a sum of 7, is :

- (1)  $\frac{7}{36}$       (2)  $\frac{6}{36}$       (3)  $\frac{5}{36}$       (4)  $\frac{8}{36}$

52. For any two events A and B,  $P(A \cap B)$  is equal :

(1)  $P(A) - P(A \cap B)$       (2)  $P(A) - P(A \cap B)$

(3)  $P(A) - P(A \cup B)$       (4)  $P(A) + P(A \cap B)$

53. If A and B are two events, then  $P(A/B)$  is equal to :

(1)  $P(A)/P(B)$       (2)  $\frac{1-P(A+B)}{P(B)}$

(3)  $\frac{1-P(AB)}{P(B)}$       (4)  $1 - P(A/B)$

P(B)

54. If  $A \subseteq B$ , then  $B \cup A$  will be :

- (1)  $[0]$       (2)  $\phi$       (3)  $A$       (4)  $B$

55.  $P\left(\frac{\overline{A}}{A \cup B}\right)$  is equal :

- (1)  $\frac{P(A)}{P(A \cup B)}$       (2)  $\frac{P(A \cap B)}{P(A \cap B)}$       (3)  $\frac{P(A)}{P(A \cup B)}$       (4)  $\frac{P(B)}{P(A \cup B)}$

56. The period of  $\sin^4 x + \cos^4 x$  will be :

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

→ → →

57.  $a \times (b \times c)$  is equal to :

- → → → → →  
 (1)  $(a \cdot c) b - (a \cdot b) \cdot c$   
 → → → → → →  
 (2)  $(a \cdot c) b + (a \cdot b) \cdot c$   
 → → → → → →  
 (3)  $(a \cdot b) c + (a \cdot b) \cdot c$   
 → → → → → →  
 (4)  $(a \cdot b) c - (a \cdot c) \cdot b$

58. The angle between the vectors  $(i+j)$  and  $(j+k)$  is

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

59. The area of the region bounded by the curves  $y = x \sin x$ , axis of  $x$ ,  $x = 0$  and  $x = 2\pi$  will be :

- (1)  $8\pi$       (2)  $4\pi$       (3)  $2\pi$       (4)  $\pi$

$\frac{\pi}{2}$

60.  $\int_0^{\frac{\pi}{2}} \log \sin x \, dx$  is equal to :

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

b

61.  $\int_a^b f(x) \, dx$  is equal to

- (1)  $\int_b^a f(x-a-b) \, dx$       (2)  $\int_a^b f(a-x) \, dx$       (3)  $\int_a^b f(a+b-x) \, dx$       (4) none of these

62.  $\int_0^{\pi/2} \sin 2x \log \tan x \, dx$  is equal to :  
(1)  $2\pi$             (2)  $\pi$             (3)  $0$             (4)  $\pi/2$
63.  $\int_0^{\pi} \cos^3 x \, dx$  is equal to :  
(1)  $4\pi$             (2)  $2\pi$             (3)  $\pi$             (4)  $0$
64.  $\int_0^{\pi/2} \frac{1}{1 + \sqrt{\tan x}} \, dx$  is equal to :
65.  $\int \cot x \, dx$  is equal to :  
(1)  $\log \tan x + C$             (2)  $\log \sec x + C$   
(3)  $\log \operatorname{cosec} x + C$             (4)  $\log \sin x + C$
66. If  $z = x + y \, iy$  then  $|z - 5|$  is equal to :  
(1)  $\sqrt{(x - y)^2 + 5^2}$             (2)  $\sqrt{(x - 5)^5 + y^2}$   
(3)  $\sqrt{x^2 + (y - 5)^2}$             (4)  $\sqrt{(x - 5)^2 + (y - 5)^2}$
67. If  $\alpha$  and  $\beta$  are the roots of the equation  $4x^2 + 3x + 7 = 0$  then  $\frac{1}{\alpha} + \frac{1}{\beta}$  is equal to :  
(1)  $\frac{7}{3}$             (2)  $\frac{2}{7}$             (3)  $\frac{-3}{7}$             (4)  $\frac{3}{7}$
68.  $2,357$  is equal to :  
(1)  $\frac{2379}{999}$             (2)  $\frac{2355}{999}$             (3)  $\frac{2355}{997}$             (4) none of these
69. If the second term of a G.P. is 2 and the sum of its infinite terms is 8, then its first term is :  
(1) 2            (2) 4            (3) 6            (4) 8
70.  $(1+2+3+\dots+n)$  is equal to :  
(1)  $\left[\frac{n(n+1)}{2}\right]^2$             (2)  $n^2$             (3)  $\frac{n(n+1)}{2}$             (4)  $\frac{n(n-1)}{2}$
71. For  $n \in \mathbb{N}$ ,  $2^{3^n} - 7n - 1$  is divisible by :  
(1) 50            (2) 49            (3) 51            (4) 48
72. If  $x = 2 + 2^{1/3} + 2^{2/3}$ , then  $x^3 - 6x^2 + 6x$  is equal to :

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

73. If  $(1-x)^n = C_0 + C_1x + \dots + C_nx^n$  then  $C_1 + 2C_2 + 3C_3 + \dots + nC_n$  is equal is

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

74. Determinate  $\begin{vmatrix} 1+ib & c+id \\ c-id & a-ib \end{vmatrix}$  is equal to :

- (1)  $a^2 - b^2 + c^2 + d^2$  (2)  $a^2 + b^2 - c^2 - d^2$   
(3)  $(a^2 + b^2)(c^2 + d^2)$  (4)  $(a+b)(a-b)$

75.  $\begin{vmatrix} 43 & 1 & 6 \\ 35 & 7 & 4 \\ 17 & 3 & 2 \end{vmatrix}$  is equal to:

- (1) -6 (2) -110 (3) 0 (4) 150

76. If  $A = \begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix}$  then  $A^2$  is equal to:

- (1)  $\begin{pmatrix} 0 & 0 \\ 0 & 0 \end{pmatrix}$  (2)  $\begin{pmatrix} 0 & 0 \\ 0 & 1 \end{pmatrix}$  (3)  $\begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix}$  (4)  $\begin{pmatrix} 1 & 1 \\ 1 & 1 \end{pmatrix}$

77. If  $A = \begin{pmatrix} 1 & 1 \\ 0 & 1 \end{pmatrix}$  then  $A^n$  is equal to :

- (1)  $\begin{pmatrix} 1 & n^n \\ 0 & 1 \end{pmatrix}$  (2)  $\begin{pmatrix} n & n \\ 0 & n \end{pmatrix}$  (3)  $\begin{pmatrix} 1 & n \\ 0 & 1 \end{pmatrix}$  (4)  $\begin{pmatrix} 1 & 1 \\ 0 & 1 \end{pmatrix}$

78. If A and B are the invertible matrix of the required order then the value of  $(AB)^{-1}$  will be :

- (1)  $[(AB)']^{-1}$  (2)  $A^{-1}B^{-1}$  (3)  $B^{-1}A^{-1}$  (4)  $(BA)^{-1}$

79. The value of  $\sin 3x$  is :

- (1)  $4 \sin x - 3 \sin^3 x$  (2)  $4 \sin x + 3 \sin^3 x$   
(3)  $3 \sin x - 4 \sin^3 x$  (4)  $3 \sin x + 4 \sin^3 x$

80. The imaginary roots of  $(-1)^{1/3}$  is :

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

81. The argument and modulus of the  $e^{\sin i\theta}$  is :

- (1)  $1, \sin h\theta$  (2)  $1, \pi/2$  (3)  $e^{\cos \theta}, \sin h\theta$  (4)  $e^{\sin \theta}, \sin h\theta$

82. The minimum distance of a point (x, y) from a line  $ax + by + c = 0$ , is :

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- |  |  |
|--|--|
| (1) $\frac{ ax1 + by1 + c }{\sqrt{a^2 + b^2}}$       | (2) $\frac{ ax1 + by1 + c }{\sqrt{a^2 + b^2 - c}}$ |
| (3) $\frac{ ax1 + by1 + c }{\sqrt{a^2 + b^2 + c^2}}$ | (4) $\frac{ ax1 + by1 + c }{\sqrt{a^2 + b^2 + c}}$ |

83. A straight line through ( 1, 1) and parallel to the line  $2x + 3y - 7 = 0$  is :

- |                       |                       |
|-----------------------|-----------------------|
| (1) $2x + 3y + 5 = 0$ | (2) $3x - 2y + 7 = 0$ |
| (3) $3x + 2y - 8 = 0$ | (4) $2x + 3y - 5 = 0$ |

84. Equation of the straight line passing through the points (-1, 3) and (4, -2) is :

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

85. The general equation of circle passing through the point of intersection of circle  $S = 0$  and line  $P = 0$ , is :

- |   |                   |
|---|-------------------|
| (1) $S + \lambda P = 0, \lambda \in \mathbb{R}$ | (2) $6S + 4P = 0$ |
| (3) $3S + 4P = 0$                               | (4) $4S + 5P = 0$ |

86. The equation of the radial axis of two circle  $x^2 + y^2 + 2g_1x + 2f_1y + c_1 = 0$  and  $x^2 + y^2 + 2g_2x + 2f_2y + c_2 = 0$ , is :

- |   |
|---|
| (1) $2(g_1 - g_2)x + 2(f_1 - f_2)y - c_1 - c_2 = 0$ |
| (2) $2(g_2 - g_1)x + 2(f_1 - f_2)y + c_1 - c_2 = 0$ |
| (3) $2(g_1 - g_2)x + 2(f_1 - f_2)y + c_1 - c_2 = 0$ |
| (4) $2(g_1 - g_2)x + 2(f_1 - f_2)y + c_2 - c_1 = 0$ |

87. If  $f(x) = \cos(\log x)$ , then  $f(x)f(y) - 1 [f(\frac{x}{y}) - f(xy)]$  is equal to :

- |       |              |                      |                       |
|-------|--------------|----------------------|-----------------------|
| (1) 0 | (2) $f(x+y)$ | (3) $f(\frac{x}{y})$ | (4) $f(\frac{y}{xy})$ |
|-------|--------------|----------------------|-----------------------|

88. If  $f(x) = \frac{x}{x-1} = y$ , then the value of  $f(y)$  is :

- |           |           |           |         |
|-----------|-----------|-----------|---------|
| (1) $1-x$ | (2) $x+1$ | (3) $x-1$ | (4) $x$ |
|-----------|-----------|-----------|---------|

89.  $\lim_{n \rightarrow \infty} \left[ \frac{1^2}{13 + n^3} + \frac{2^2}{23 + n^3} + \frac{1}{2n} \right]$  is equal to :

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

90.  $\lim_{x \rightarrow a} \frac{x^2 - a^2}{x - a}$  is equal to :

- |              |       |       |        |
|--------------|-------|-------|--------|
| (1) $\infty$ | (2) 0 | (3) a | (4) 2a |
|--------------|-------|-------|--------|

91.  $\frac{d}{dx} (2^x)$  is equal to :

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- (1) 1 (2)  $2^x \log 2$  (3)  $x \log 2$  (4) 0

**92. Differential coefficient of  $x^3$  w.r.t.  $x^2$  will be :**

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

**93.  $\frac{d}{dx} (\tan x)$  is equal to :**

- (1)  $\operatorname{cosec}^2 x$  (2)  $\sec x \tan x$  (3)  $\operatorname{cosec} x \cot x$  (4)  $\sec^2 x$

**94. The coordinates of the point where the tangent to the curve  $x^2 + y^2 - 2x - 3 = 0$  is parallel to the axis of x is :**

- (1)  $1 \pm \sqrt{3}$  (2) (1,0) (3)  $1 \pm 2$  (4)  $(1 \pm \sqrt{2})$

**95. The point at which tangent to the curve  $y = \tau^{2x}$  at the point (0, 1) meets the x-axis is :**

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

**96. Maximum value of slope of a tangent to the curve  $y = -x^3 + 3x^2 + 2x - 27$  will be :**

- (1) 11 (2) -4 (3) 5 (4) 2

**97.  $\int \frac{\sin \sqrt{x}}{\sqrt{x}} dx$  is equal to :**

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

**98. Correct statement is :**

- (1)  $(AB)^{-1} = B^{-1}A^{-1}$  (2)  $(AB)^{-1} = A^{-1}B^{-1}$  (3)  $(AB)^T = A^T B^T$  (4)  $(AB)^{-1} = A^{-1}B^{-1}$

**99. If the matrix  $P = \begin{pmatrix} 1 & 2 \\ -3 & 0 \end{pmatrix}$  and  $Q = \begin{pmatrix} -1 & 0 \\ 2 & 3 \end{pmatrix}$  then the correct statement is :**

- (1)  $P + Q = I$  (2)  $PQ \neq QP$  (3)  $Q^2 = Q$  (4)  $P^2 = P$

### ANSWER SHEET

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