NDA (MATHS) MOCK TEST - 41 (SOLUTION)

1. (A) We have

$B = B \cup (A \cap B)$
$= B \cup (A \cap C)$ $(\because A \cap B = A \cap C)$
$= (B \cup A) \cap (B \cup C)$ (by Statement II)
$= (A \cup C) \cap (B \cup C)$
$= (A \cap B) \cup C$ $(\because A \cap B = A \cap C)$
$= (A \cap C) \cup C = C$

Hence, Statement II is the correct explanation of Statement I.

2. (C) $\because B = U - A = A'$

$\therefore n(B) = n(A') = n(U) - n(A)$

Hence, Statement I is true

but for any three arbitary sets A, B, C we can not always have

$n(c) = n(A) - n(B)$ if $C = A - B$

as it is not specified A is universal set or not. In case not conclude $n(C) = n(A) - n(B)$.

Hence, Statement II is false.

3. (A) Let S be the set of all even prime numbers.

$\therefore S = [2]$ = non empty set

4. (A)

5. (B)

6. (B) $\because \omega^{13} + \omega^{20} = \omega + \omega^2 = -1$

$\therefore E = \sin\left(-\pi + \frac{\pi}{4}\right)$

$= -\sin\frac{3\pi}{4} = -\frac{1}{\sqrt{2}}$

7. (D) $E = \left(\frac{1-i}{1+i}\right)^{n-2}(1-i)^2 = \left(-\frac{2i}{2}\right)^{n-2}(-2i)$

$= 2(-i)^{n-1} = 2[(-i)^2]^{(n-1/2)} = 2(-1)^{(n-1)/2}$

Since, E is real and positive.

Therefore, $\frac{n-1}{2} = 2\lambda$

$\therefore n = 4\lambda + 1$

i.e., odd of this type but not any odd.

8. (B) Now, $\frac{i+\sqrt{3}}{-i+\sqrt{3}} = \frac{(i+\sqrt{3})^2}{(\sqrt{3}-i)(\sqrt{3}+i)}$

$= \frac{i^2+3+2\sqrt{3}i}{3+1} = \frac{-1+3+2\sqrt{3}i}{4}$

$= \frac{1+\sqrt{3}i}{2} = -\omega^2$

and $\frac{i-\sqrt{3}}{i+\sqrt{3}} = \frac{(i-\sqrt{3})^2}{i^2-(\sqrt{3})^2}$

$= \frac{i^2+3-2i\sqrt{3}}{-4} = \frac{2-2i\sqrt{3}}{-4} = \frac{-1+\sqrt{3}i}{2} = \omega$

$\therefore \left(\frac{i+\sqrt{3}}{-i+\sqrt{3}}\right)^{200} + \left(\frac{i-\sqrt{3}}{i+\sqrt{3}}\right)^{200} + 1$

$= (-\omega^2)^{200} + \omega^{200} + 1$

$= \omega^{3\times133+1} + \omega^{3\times66+2} + 1$

$= \omega + \omega^2 + 1 = 0$

9. (A) Since, α is a complex root of unity such that

$\alpha^2 + \alpha + 1 = 0$

$\Rightarrow \alpha = \omega$ or ω^2

$\therefore \alpha^{31} = (\omega)^{31} = \omega = \alpha$

10. (A)

11. (C) $1\times2^4 + 1\times2^3 + 1\times2^2 + 0\times2^1 + 1\times2^0 + 0\times2^{-1} + 0\times2^{-2} + 1\times2^{-3}$

$= 16 + 8 + 4 + 0 + 1 + 0 + 0 + \frac{1}{8}$

$= 29 + \frac{1}{8} = \frac{233}{8} = (29.125)_{10}$

12. (A) $x = \frac{1}{1-a}, y = \frac{1}{1-b} \therefore a = \frac{x-1}{x}, \ b = \frac{y-1}{y}$

$\therefore 1 + ab + a^2b^2 + ...\infty$

$= \frac{1}{1-ab} = \frac{1}{1-\frac{(x-1)(y-1)}{xy}} = \frac{xy}{x+y-1}$

13. (B) Let 'r' be the common ratio of GP, then

$S = \frac{a}{1-r}, \ r = 1 - \frac{a}{s}$

$\therefore S_n = \frac{a(1-r^n)}{1-r} = \frac{a}{1-r}(1-r^n) = S\left[1-\left(1-\frac{a}{s}\right)^n\right]$

14. (A)

15. (A) If a, b, c are in GP., then a + b, b + b, c + b an in HP

$\Rightarrow 2b = \frac{2(a+b)(b+c)}{a+b+b+c}$

$\Rightarrow b(a + 2b + c) = (a + b)(b + c)$

$\Rightarrow ab + 2b^2 + bc = ab + ac + b^2 + bc$

$\therefore b^2 = ac$ $(\because$ a, b, c, are in GP)

Hence, Statements II is the correct explanation for Statement I

16. (D) Sum of n terms of an AP is $S_n = \frac{n}{2}$ [2A + (n–1)D]
where, A and D are first term and common difference.
Hence, sum is always of the form $an^2 + bn$
Hence, Statement I is false, and Statement II is true.

17. (C) Given, $\frac{1}{b-a} + \frac{1}{b-c} = \frac{1}{a} + \frac{1}{c}$

$\Rightarrow \frac{1}{b-a} - \frac{1}{c} = \frac{1}{a} - \frac{1}{b-c} \Rightarrow \frac{(c-b+a)}{c(b-a)} = \frac{(b-c-a)}{a(b-c)}$

$\Rightarrow \frac{1}{c(b-a)} = -\frac{1}{a(b-c)} \Rightarrow$ ba – ca = – cb + ac

$\Rightarrow$ ab + bc = 2ac

$\therefore$ $b = \frac{2ac}{a+c}$

Hence, a,b, c are in HP.

18. (C) Replacing x by $\frac{1}{x}$ in the first equation, we get the second equation and hence, its roots are $\frac{1}{\alpha}$ and $\frac{1}{\beta}$.

19. (A) Dividing the equation $a^3 x^2 + abcx + c^3 = 0$ by c^2, we get $a\left(\frac{ax}{c}\right)^2 + b\left(\frac{ax}{c}\right) + c = 0$

$\Rightarrow \frac{ax}{c} = \alpha, \beta$

$\Rightarrow x = \frac{c}{a}\alpha, \frac{c}{a}\beta$

$\Rightarrow x = \alpha^2\beta, \alpha\beta^2$ $\left(\because \frac{c}{a} = \alpha\beta = \text{product of roots}\right)$

Hence, $\alpha^2\beta$ and $\alpha\beta^2$ are the roots of the equation $a^3 \times x^2 + abcx + c^3 = 0$

20. (D) $\sin\theta + \cos\theta = -\frac{b}{a}$

$\sin\theta \cos\theta = \frac{c}{a}$

Now, $(\sin\theta + \cos\theta)^2 = 1 + 2\sin\theta\cos\theta$

$\Rightarrow \frac{b^2}{a^2} = 1 + \frac{2c}{a} = \frac{a+2c}{a}$

$\Rightarrow b^2 = a^2 + 2ac$

$\Rightarrow b^2 + c^2 = a^2 + 2ac + c^2 = (a + c)^2$

$\therefore$ $b^2 + c^2 = (a + c)^2$

21. (B) Use $\alpha^3 + \beta^3 = (\alpha+\beta)^3 - 3\alpha\beta(\alpha + \beta)$

22. (A)

23. (B) Let there be n persons in a room.
$\therefore$ Total number of shankhands = ${}^nC_2 = 66$

$\Rightarrow \frac{1}{2}n(n-1) = 66 \Rightarrow n^2 - n - 132 = 0$

$\Rightarrow (n + 11)(n - 12) = 0 \Rightarrow n = 12$ $(\because n \neq -11)$

24. (C)

25. (B) Total number of lines in n-sided regular polygon = ${}^nC_2$
and total number of sides in n-sided regular polygon = n
$\therefore$ Number of diagonals in n-sided regular polygon

$= {}^nC_2 - n = \frac{n(n-1)}{2} - n = n\left\{\frac{n-1}{2} - 1\right\}$

$= \frac{n(n-3)}{2}$

26. (C) Total number of arrangements = 6! = 720
Total number of arrangements while all the Hindi books are together = 4! × 3! = 24 × 6 = 144
$\therefore$ Number of ways, in which books are arranged, while all Hindi books are not together = 720– 144 = 576

27. (C) $(1 + x + x^2 + x^3)^{11} = [(1 + x)(1 + x^2)]^{11}$
$= (1+ x)^{11} \cdot (1+ x^2)^{11}$
$= ({}^{11}C_0 + {}^{11}C_1 x + {}^{11}C_2 x^2 + {}^{11}C_3 x^3 + {}^{11}C_4 x^4 + \ldots)$ $({}^{11}C_0 + {}^{11}C_1 x^2 + {}^{11}C_2 x^4 + \ldots)$
$\therefore$ Coefficient of x^4 in $(1 + x + x^2 + x^3)^{11}$
$= {}^{11}C_0 \cdot {}^{11}C_2 + {}^{11}C_2 \cdot {}^{11}C_1 + {}^{11}C_4 \cdot {}^{11}C_0 = 990$

28. (C) Given, $(1 + 2x + x^2)^{10} = \{(1 + x)^2\}^{10} = (1 + x)^{20}$
$\therefore$ Total terms = 20 + 1 = 21

29. (A) Given $(1 + i)^5 + (1 - i)^5$
$= ({}^5C_0 + {}^5C_1 i + {}^5C_2 i^2 + {}^5C_3 i^3 + {}^5C_4 i^4 + {}^5C_5 i^5)$
$+ ({}^5C_0 - {}^5C_1 i + {}^5C_2 i^2 - {}^5C_3 i^3 + {}^5C_4 i^4 - {}^5C_5 i^5)$
(by Bionomial theorem)
$2({}^5C_0 + {}^5C_2 i^2 + {}^5C_4 i^4) = 2[1 - 10 + 5] = -8$

30. (A) $T_{r+1} = {}^9C_r (3x)^{9-r}\left(-\frac{x^3}{6}\right)^r = {}^9C_r\, x^{9+2r}(3)^{9-r}\left(-\frac{1}{6}\right)^r$

For coefficient of x^{17}, $9 + 2r = 17 \Rightarrow r = 4$

$\therefore$ $T_5 = {}^9C_4 (3)^{9-4}\left(-\frac{1}{6}\right)^4 = 126 \times 3^5 \times \frac{1}{6^4} = \frac{189}{8}$

31. (C) Given expression can be rewritten as
$\log_{xyz} xy + \log_{xyz} yz + \log_{xyz} zx$
$= \log_{xyz}(xy \cdot yz \cdot zx) = \log_{xyz}(x^2 y^2 z^2)$
$= \log_{xyz}(xyz)^2 = 2 \times 1 = 2$

32. (B) $(\log_3 x)(\log_x 2x)(\log_{2x} y) = \log_x x^2$

$\Rightarrow \dfrac{\log x}{\log 3} \times \dfrac{\log 2x}{\log x} \times \dfrac{\log y}{\log 2x} = \dfrac{\log x^2}{\log x}$

$\left(\because \log_b a = \dfrac{\log a}{\log b}\right)$

$\Rightarrow \dfrac{\log y}{\log 3} = \dfrac{2\log x}{\log x}$ $(\because \log a^b = b \log a)$

$\Rightarrow$ log y = 2 log 3

$\Rightarrow$ log y = log 3^2 $(\because \log m = \log n \Rightarrow m = n)$

$\Rightarrow$ log y = log 9

$\therefore$ y = 9

33. (D) $A^2 = \begin{bmatrix} 3 & -4 \\ 1 & -1 \end{bmatrix}\begin{bmatrix} 3 & -4 \\ 1 & -1 \end{bmatrix} = \begin{bmatrix} 5 & -8 \\ 2 & -3 \end{bmatrix}$

$A^2 = A^n$ for n = 2, putting n = 2 in the matrices given in (A), (B) and (C), we do not get $\begin{bmatrix} 5 & -8 \\ 2 & -3 \end{bmatrix}$

Solution(Q nos. 34-36)

Since, BA is defined.

$\therefore$ Number of columns in B = Number of rows in A

$\Rightarrow 11 - y = x \Rightarrow x + y = 11$ ....(1)

Also AB is defined

$\therefore$ Number of columns in A = Number of rows in B

$\therefore x + 5 = y$

$\Rightarrow x - y = -5$

34. (B) On adding Eqs. (i) and (ii), we get

$2x = 6 \Rightarrow x = 3$

35. (A) On subtracting Eq. (ii) from Eq. (i), we get

$2y = 16 \Rightarrow y = 8$

36. (A) Order of AB = (Number of rows in A) × (Number of columns in B)

$= x \times 11 - y = 3 \times 3$

37. (C) If AB = 0, then it may be concluded that either |A| = 0 or |B| = 0.

38. (B) $\because A = \begin{bmatrix} 3 & 2 \\ 1 & 4 \end{bmatrix}$

$\therefore A[\text{adj}(A)] = I_2 |A|$

$= \begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}\begin{vmatrix} 3 & 2 \\ 1 & 4 \end{vmatrix} = \begin{bmatrix} 10 & 0 \\ 0 & 10 \end{bmatrix}$

39. (D) Put $x = 0$ in given equation $c = \begin{vmatrix} 0 & -1 & 3 \\ 1 & 0 & -4 \\ -3 & 4 & 0 \end{vmatrix} = 0$

(since, skew symmetric determinant of odd order is zero)

40. (C) $\Delta = -(a^3 + b^3 + c^3 - 3abc)$

$= -(a + b + c)\dfrac{1}{2}[(a - b)^2 + (b - c)^2 + (c - a)^2]$

Since, a, b and c are distinct negative real numbers, hence $\Delta \geq 0$.

41. (C) In a triangle, A + B + C = π

$\therefore$ cos (A + B) = cos (π – C) = – cos C

$\Rightarrow$ cos A cos B + cos C = sin A sin B

and sin (A + B) = sin C

Expanding the given determinant, we get

$\Delta = (1 - \cos^2 A) + \cos C [\cos C + \cos A \cos B] + \cos B[\cos B + \cos A \cos C]$

$= -\sin^2 A + \cos C (\sin A \sin B) + \cos B(\sin A \sin C)$

$= -\sin^2 A + \sin A \sin (B + C) = -\sin^2 A + \sin^2 A = 0$

42. (A) We know that, a square matrix A' is an orthogonal matrix, if $AA^T = I$

$\Rightarrow |AA^T| = |I| \Rightarrow |A||A^T| = I$

$\Rightarrow |A||A| = 1$ $(\because |A| = |A^T|)$

$\Rightarrow |A|^2 = 1$

$\Rightarrow |A| = \pm 1$

43. (D) $\begin{vmatrix} 6a & 3b & 15c \\ 2l & m & 5n \\ 2p & q & 5r \end{vmatrix} = 30\begin{vmatrix} a & b & c \\ l & m & n \\ p & q & r \end{vmatrix} = 30 \times 2 = 60$

44. (A) $\tan^4 A - \sec^4 A + \tan^2 A + \sec^2 A$

$= (\tan^2 A)^2 - (\sec^2 A)^2 + (\tan^2 A + \sec^2 A)$

$= (\tan^2 A - \sec^2 A)(\tan^2 A + \sec^2 A) + (\tan^2 A + \sec^2 A)$

$= (-1)(\tan^2 A + \sec^2 A) + (\tan^2 A + \sec^2 A)$

$(\because \sec^2 A - \tan^2 A = 1)$

$= -(\tan^2 A + \sec^2 A) + (\tan^2 A + \sec^2 A) = 0$

45. (A) Given that, $\dfrac{\sin\theta}{\mathrm{cosec}\,\theta} + \dfrac{\cos\theta}{\sec\theta}$

$= \dfrac{\sin\theta}{(1/\sin\theta)} + \dfrac{\cos\theta}{(1/\cos\theta)}$

$= \sin^2\theta + \cos^2\theta = 1$

46. (D) sin 50° – sin 70° + sin 10°

$= 2\cos\dfrac{70° + 50°}{2} \cdot \sin\dfrac{50° - 70°}{2} + \sin 10°$

$= -2\cos 60° \sin 10° + \sin 10°$

$= -\sin 10° + \sin 10° = 0$

47. (C) I. $\mathrm{cosec}^{-1}\left(-\dfrac{2}{\sqrt{3}}\right) = \sin^{-1}\left(-\dfrac{\sqrt{3}}{2}\right) = \sin^{-1}[-\sin(\pi/3)] = -\dfrac{\pi}{3}$

II. $\sec^{-1}\left(\dfrac{2}{\sqrt{3}}\right) = \cos^{-1}\left(\dfrac{\sqrt{3}}{2}\right) = \cos^{-1}\left(\cos\dfrac{\pi}{6}\right) = \dfrac{\pi}{6}$

48. (D) Given, $\sin^{-1} x + \sin^{-1} y = \frac{\pi}{2}$ .... (i)

and $\cos^{-1} x - \cos^{-1} y = 0$

$\Rightarrow \left(\frac{\pi}{2} - \sin^{-1} x\right) - \left(\frac{\pi}{2} - \sin^{-1} y\right) = 0$

$\Rightarrow \sin^{-1} y - \sin^{-1} x = 0$

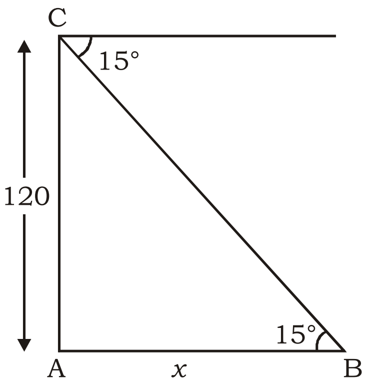
$\Rightarrow \sin^{-1} y = \sin^{-1} x$ ......(ii)

From Eqs. (i) and (ii),

$2 \sin^{-1} x = \frac{\pi}{2} \Rightarrow \sin^{-1} x = \frac{\pi}{4} \Rightarrow x = \frac{1}{\sqrt{2}}$

From Eq. (ii), $y = \frac{1}{\sqrt{2}}$

49. (C



Now, In Δ ABC,

$\tan 15° = \frac{120}{x} \Rightarrow \tan(60° - 45°) = \frac{\sqrt{3}-1}{\sqrt{3}+1} = \frac{120}{x}$

$\Rightarrow x = 120 \times \frac{\sqrt{3}+1}{\sqrt{3}-1} = 120\,(2 + \sqrt{3})$

$= 120 \times 3.7 = 444$ m

50. (A) We know that,

$\sin C = \sin[\pi - (A + B)] = \sin(A + B)$

and $\sin A = \sin(B + C)$

$\therefore \quad \frac{\sin A}{\sin C} = \frac{\sin(B+C)}{\sin(A+B)}$

But $\quad \frac{\sin A}{\sin C} = \frac{\sin(A-B)}{\sin(B-C)}$

$\therefore \quad \frac{\sin(B+C)}{\sin(A+B)} = \frac{\sin(A-B)}{\sin(B-C)}$

$[\because \sin(A + B)\cdot \sin(A - B) = \sin^2 A - \sin^2 B]$

$\Rightarrow \sin^2 B - \sin^2 C = \sin^2 A - \sin^2 B$

$\Rightarrow b^2 - c^2 = a^2 - b^2$

$\Rightarrow 2b^2 = a^2 + c^2$

so, a, b and c are in AP.

51. (A) $\cos B = \left(\frac{c^2 + a^2 - b^2}{2ca}\right)$

$\Rightarrow \cos^2 B = \frac{a^4 + b^4 + c^4 - 2b^2c^2 - 2a^2b^2 + 2a^2c^2}{4a^2c^2}$

$\Rightarrow \cos^2 B = \frac{1}{2} \Rightarrow \cos B = \pm \frac{1}{\sqrt{2}}$

$\therefore$ B = 45° or 135°

52. (B) We know that,

$r = 4R \sin\frac{A}{2} \sin\frac{B}{2} \sin\frac{C}{2}$

$= 4R\left(\frac{1}{2}\right)^3 = \frac{R}{2}$ $\quad (\because A = B = C = 60°)$

53. (D) Equation of line prallel to $2x + 3y + 5 = 0$ is

$2x + 3y + \lambda = 0$

But it passes throuht (1, 1).

$\therefore \; 2 + 3 + \lambda = 0 \Rightarrow \lambda = -5$

So, the required equations is $2x + 3y - 5 = 0$.

54. (D) Perpendicular distance of the line $3x + 4y - 1 = 0$ from the point (1, 1) = Perpendicular distance of the line $4x + 3y + 2k = 0$ from the point (1, 1)

$\Rightarrow \frac{|3\times 1 + 4\times 1 - 1|}{\sqrt{9+16}} = \frac{|4\times 1 + 3\times 1 + 2k|}{\sqrt{16+9}}$

$\Rightarrow \frac{|3+4-1|}{5} = \frac{|4+3+2k|}{5}$

$\Rightarrow 6 = 7 + 2k \Rightarrow 2k = -1$

$\Rightarrow k = -\frac{1}{2}$

55. (B) A line which passes through the points (5, 0) and (0, 3) is

$(y - 0) = \frac{3-0}{0-5}(x - 5)$

$\Rightarrow -5y = 3x - 15$

$\Rightarrow 3x + 5y - 15 = 0$ ...... (i)

Now, length of the perpendicular from the point (4, 4) on the line (i) is

$= \frac{|3(4) + 5(4) - 15|}{\sqrt{(3)^2 + (5)^2}} = \frac{|12 + 20 - 15|}{\sqrt{9+25}}$

$= \frac{17}{\sqrt{34}} = \sqrt{\frac{17}{2}}$

56. (C) Let A (a, 0) and B (0, b) are two points on respective coordinate axes and (– 5, 4) divides AB in the ratio 1 : 2

$\therefore \; -5 = \frac{1\times 0 + 2\times a}{3} \Rightarrow a = \frac{-15}{2}$

and $4 = \frac{1 \times b + 2 \times 0}{3} \Rightarrow b = 12$

Hence, equation of line joining $\left(-\frac{15}{2}, 0\right)$ and (0, 12) is

$$(y - 0) = \frac{12 - 0}{0 + \frac{15}{2}} \cdot \left(x + \frac{15}{2}\right)$$

$\Rightarrow y = \frac{4}{5}(2x + 15)$

$\Rightarrow 5y = (8x + 60) \Rightarrow 8x - 5y + 60 = 0$

57. (C) $A = \pi r^2$, where r is the distance between (1, 2) and (4, 6).

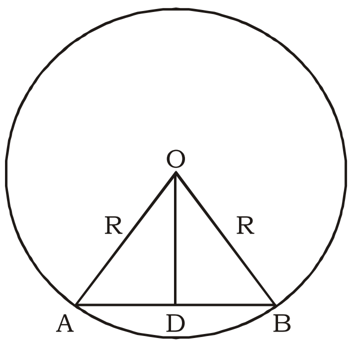
$\Rightarrow \sqrt{(x_2 - x_1)^2 (y_2 - y_1)^2} = \sqrt{3^2 + 4^2} = \sqrt{9 + 16} = 5$

$\therefore A = \pi r^2 = \pi, 25 = 25\pi$

58. (B) If (x, y) be the point, then by ratio formula $x = 4\cos\theta + 3,\ y = 4\sin\theta$

$\therefore (x - 3)^2 + y^2 = 16$

59. (A) In ΔAOD,



$\sin\frac{\theta}{2} = \frac{AD}{OA} \Rightarrow \sin\frac{\theta}{2} = \frac{AD}{R}$

$\Rightarrow AD = R\sin\frac{\theta}{2}$

$\therefore$ Length of the chord $AB = 2\,AD = 2R\sin\frac{\theta}{2}$

60. (B) $x = 2 + t^2,\ y = 2t + 1$

Eliminating t, we get

$(y - 1)^2 = 2(x - 2)$

which is a parabola with vertex at (2, 1).

61. (A) Clearly, the race course will be an ellipse with the flag posts as its foci. If a and b are the semi major and semi minor axes of the ellipse, then 2a = 10 and 2ae = 8

$\therefore a = 5,\ c = \frac{4}{5}$

and $b^2 = a^2(1 - c^2) = 9$

$\therefore$ Area of the ellipse $= \pi ab = \pi \cdot 5 \cdot 3 = 15\pi$ sq m

62. (B) Equation of any tangent to the parabola $P : y^2 = 8x$ is

$$y = mx + \frac{2}{m}$$

where, m is the slope, of tangent ,

Since, it touches $E : \frac{x^2}{4} - \frac{y^2}{16} = 1$

$\left(\frac{2}{m}\right)^2 = 4m^2 + 15 \Rightarrow m = \pm\frac{1}{2}$

Equations of the tangents are $x \pm 2y + 8 = 0$

63. (A) When $m = \frac{1}{2}$, the slope of the normal is -2 and equations of the normal to the parabola is

$y = 2x - 2(2)(-2) - 2(-2)^3 \Rightarrow 2x + y = 24$

64. (C) We know that, the direction cosines of X-axis is (1,0,0).

$\therefore$ Som of squares of direction cosine

$= (1)^2 + (0)^2 + (0)^2$

$= 1 + 0 + 0 = 1$

65. (B) The equation of line passing through $(x_1. y_1, z_1)$ and $(x_2, y_2, z_2)$is

$$\frac{x - x_1}{x_2 - x_1} = \frac{y - y_1}{y_2 - y_1} = \frac{z - z_1}{z_2 - z_1} \quad \text{.... (i)}$$

Here, $(x_2 - x_1)$, $(y_2 - y_1)$ and $(z_2 - z_1)$ direction ratio's of that line.

Then, its direction cosines are

$$l = \frac{(-2 - 1)}{\sqrt{(-3)^2 + (1)^2 + (4)^2}},$$

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

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

$\Rightarrow l = \frac{-3}{\sqrt{26}},\ m = \frac{1}{\sqrt{26}},\ n = \frac{4}{\sqrt{26}}$

$\therefore l^2 + m^2 + n^2 = \left(\frac{-3}{\sqrt{26}}\right)^2 + \left(\frac{1}{\sqrt{26}}\right)^2 + \left(\frac{4}{\sqrt{26}}\right)^2$

$= \frac{9}{26} + \frac{1}{26} + \frac{16}{26} = \frac{26}{26} = 1$

66. (A)

67. (A) $a^y = x + \sqrt{x^2 + 1} \Rightarrow a^{-y} = \frac{1}{x + \sqrt{x^2 + 1}}$

$= \dfrac{x-\sqrt{x^2+1}}{-1}$

$\therefore$ $a^y - a^{-y} = 2x \Rightarrow x = \dfrac{1}{2}(a^y - a^{-y}) = f^{-1}(y)$

68. (D)

69. (B) $\lim\limits_{\theta\to\pi/4} \dfrac{\sqrt{2}-\sqrt{2}\cos(\theta-\pi/4)}{16(\theta-\pi/4)^2}$

$= \lim\limits_{y\to 0} \dfrac{\sqrt{2}}{16}\cdot\dfrac{(1-\cos y)}{y^2}$

where, $y = \theta - \dfrac{\pi}{4} \to 0$ as $\theta \to \dfrac{\pi}{4}$

$= \dfrac{1}{8\sqrt{2}} \cdot \lim\limits_{y\to 0} \dfrac{2\sin^2(y/2)}{y^2}$

$= \dfrac{1}{8\sqrt{2}} \cdot \dfrac{1}{2} = \dfrac{1}{16\sqrt{2}}$ $\left(\because \lim\limits_{\theta\to 0} \sin\theta = 0\right)$

70. (A) $\underset{x\to 0}{Lt} \dfrac{a^x - b^x}{x}$

$= \lim\limits_{x\to 0} \dfrac{a^x - b^x - 1 + 1}{x}$

$= \lim\limits_{x\to 0} \dfrac{(a^x-1)-(b^x-1)}{x}$

$= \lim\limits_{x\to 0} \dfrac{a^x-1}{x} - \lim\limits_{x\to 0} \dfrac{b^x-1}{x}$

$= \log a - \log b = \log \dfrac{a}{b}$

71. (A) I. $\lim\limits_{x\to 0} \dfrac{x^2}{x} = \lim\limits_{x\to 0} (x) = 0$

II. It is true that $\dfrac{x^2}{x}$ is not continuous at $x = 0$

III. LHL $= \lim\limits_{h\to 0} \dfrac{|0-h|}{(0-h)}$

$= \lim\limits_{h\to 0} \dfrac{h}{-h} = -1$

RHL $= \lim\limits_{h\to 0} \dfrac{|0+h|}{(0+h)}$

$= \lim\limits_{h\to 0} \dfrac{h}{h} = 1$

$\therefore$ LHL $\neq$ RHL

So, it does not exist.

72. (A) $f(x) = \log_a(\log_a x) = \log_a \left(\dfrac{\log_e x}{\log_e a}\right)$

$= \log_a(\log_e x) - \log_a(\log_e a)$

$\Rightarrow f(x) = \dfrac{\log_e(\log_e x)}{\log_e a} - \log_a(\log_e a)$

$\Rightarrow f'(x) = \dfrac{1}{\log_e a}\left(\dfrac{1}{\log_e x}\cdot\dfrac{1}{x}\right) \Rightarrow f'(x) = \dfrac{\log_a e}{x\log_e x}$

73. (C) $(y = (x + \sqrt{1+x^2})^n$

On differentiating w.r.t.x, we get

$\dfrac{dy}{dx} = n(x + \sqrt{1+x^2})^{n-1}\left(1 + \dfrac{x}{\sqrt{x^2+1}}\right)$

$= \dfrac{n\left[x+\sqrt{1+x^2}\right]^n}{\sqrt{1+x^2}}$

$\Rightarrow \dfrac{dy}{dx} = \dfrac{ny}{\sqrt{1+x^2}}$

74. (C) From solution 40,

$\dfrac{dy}{dx} = \dfrac{ny}{\sqrt{1+x^2}}$

$\Rightarrow \left(\dfrac{dy}{dx}\right)^2 (1 + x^2) = n^2y^2$

Again, differentiating w.r.t.x we get

$2\dfrac{dy}{dx}\dfrac{d^2y}{dx^2}(1+x^2) + 2x\left(\dfrac{dy}{dx}\right)^2 = 2n^2 y\dfrac{dy}{dx}$

$\Rightarrow \dfrac{d^2y}{dx^2}(1+x^2) + x\dfrac{dy}{dx} = n^2y$

75. (D) Given that, y = cos t and x = sin t

Then, $\dfrac{dy}{dt} = -\sin t$ and $\dfrac{dx}{dt} \cos t$

Now, $\dfrac{dy}{dx} = \dfrac{dy/dt}{dx/dt} = -\dfrac{-\sin t}{\cos t} = \dfrac{-x}{y}$

76. (A) $\because$ $x = k(\theta + \sin\theta)$ and $y = k(1 + \cos\theta)$

$\Rightarrow \dfrac{dx}{d\theta} = k(1 + \cos\theta)$ and $\dfrac{dy}{d\theta} = -k\sin\theta$

$\therefore \dfrac{dy}{dx} = \dfrac{-k\sin\theta}{k(1+\cos\theta)} = \dfrac{-2\sin\frac{\theta}{2}\cos\frac{\theta}{2}}{2\cos^2\frac{\theta}{2}} = -\tan\dfrac{\theta}{2}$

$\Rightarrow \left(\dfrac{dy}{dx}\right)_{\theta=\frac{\pi}{2}} = -\tan\dfrac{\pi}{4} = -1$

77. (B)

78. (B) Given equation is $y = 2x^2 - x + 1$.

On differentiating w.r.t.x, we get $\frac{dy}{dx} = 4x - 1$

Since, tangent is parallel to the given line $y = 3x + 9$

Slope of second line = $\frac{dy}{dx} = 3$

Therefore, these slopes are equal.

$\Rightarrow 4x - 1 = 3 \Rightarrow x = 1$

At $x = 1$, $y = 2(1)^2 - 1 + 1 \Rightarrow y = 2$

Thus, the point is (1, 2)

79. (C) Surface area of sphere, $S = 4\pi r^2$ and $\frac{dr}{dt} = 2$

$\therefore \frac{dS}{dt} = 4\pi \times 2r \frac{dr}{dt} = 8\pi r \times 2 = 16\pi r$

$\Rightarrow \frac{dS}{dt} \alpha\, r$

80. (C) The given function is

$f(x) = x^3 - 1, \in [-1, 1]$

$f'(x) = 3x^2 \geq 0$

So, $f(x)$ is increasing function in $[-1, 1]$

Also, $f(x)$ has no root between $(-1, 1)$.

81. (A) Given curve is $y = x^2 - 4x + 3$

Now, differential w.r.t.x, we get

$\frac{dy}{dx} = 2x - 4 = 2(x - 2)$ …… (i)

Here, at $x = 2$, $\frac{dy}{dx} = 0$

i.e, for the given curve only one tangent is possible because slope of tangent parallel to x-axis is zero.

82. (B) Let $f(x) = 2x^3 - 3x^2 - 12x + 5$

$f'(x) = 6x^2 - 6x - 12$

For largest value, $f'(x) = 0$

$\Rightarrow 6x^2 - 6x - 12 = 0$

$\Rightarrow x^2 - x - 2 = 0$

$\Rightarrow (x + 1)(x - 2) = 0$

$\Rightarrow x = -1, 2$

$f''(x) = 12x - 6$

At $x = 2$, $f''(2) = 24 - 6 = 18 > 0$ (minimum)

At $x = -1$, $f''(-1) = 12 - 6 = -18 < 0$ (maximum)

So , the function is maximum (largest) at $x = -1$ and its largest value is

$f(-1) = 2(-1)^3 - 3(-1)^2 - 12(-1) + 5$

$= -2 - 3 + 12 + 5 = 12$

83. (C) $f(x) = x^2 - 2x$

On differentiating w.r.t.x, we get

$f'(x) = 2x - 2$

For function to be increasing,

$f'(x) = > 0$

$\therefore 2x - 2 > 0 \Rightarrow x > 1$

84. (A)

85. (D) Let $I = \int e^{\log x}\, dx$

By logarithm property, $e^{\log a} = a$

$\therefore I = \int x\, dx = \left[\frac{x^2}{2}\right] + C$

86. (C) Put $xe^x = t$

87. (C) Put $\log x = t \Rightarrow \frac{1}{x}\, dx = dt$

$\therefore I = \int \frac{te^t dt}{(1+t)^2} = \int \frac{e^t}{1+t}\, dt - \int \frac{e^t}{(1+t)^2}\, dt$

$= \frac{e^t}{1+t} - \int -e^t \frac{1}{(1+t)^2}\, dt - \int \frac{e^t}{(1+t)^2}\, dt$

$= \frac{x}{1 + \log x} + C$

88. (D) Given, $f'(x) = g'(x)$

On integrating both sides, we get

$f(x) = g(x) + c \Rightarrow f(x) = x^3 - 4x + 6 + C$

$\because f(1) = 2$

$\therefore 2 = 1 - 4 + 6 + C \Rightarrow C = -1$

$\therefore f(x) = x^3 - 4x + 5$

89. (D) $\cos^2(\pi + x) = \cos^2 x$

$\therefore I_1 = \int_0^{3\pi} f(\cos^2 x)\, dx = 3\int_0^{\pi} f(\cos^2 x)\, dx = 3I_2$

$\therefore I_1 = 3I_2$

90. (A) Put $x = a \sin\theta$

$\Rightarrow dx = a\cos\theta\, d\theta$ and adjust the limits

$\therefore I = \int_0^{\pi/2} \frac{\cos\theta\, d\theta}{\sin\theta + \cos\theta} = \frac{\pi}{4}$

91. (A)

92. (B)

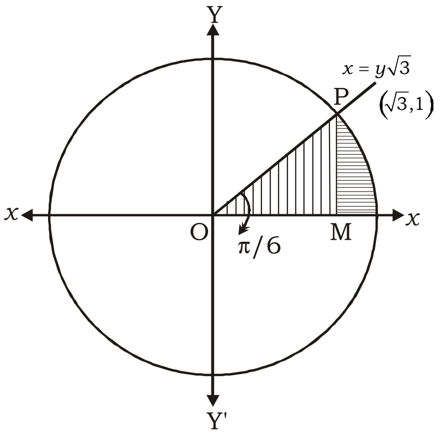
93. (B)

94. (C) Line and the curve meet at P($\sqrt{3}$, 1) in Ist quadrant.

Draw perpendicular PM.

$\therefore$ Area = Δ OPM + $\int_{\sqrt{3}}^{2} y\, dx$

Now, $x = 2\cos\theta$, $y = 2\sin\theta$, then the limits changes



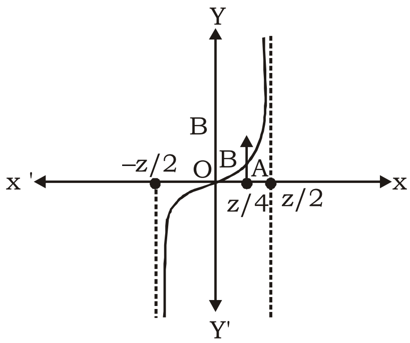
$= \frac{1}{2}\sqrt{3}\cdot 1 + \int_{\pi/6}^{0}(2\sin\theta)(-2\sin\theta)\,d\theta$

$= \frac{\sqrt{3}}{2} + 4\int_{0}^{\pi/6}\frac{(1-\cos 2\theta)}{2}\,d\theta$

$= \frac{\sqrt{3}}{2} + 2\left[\theta - \frac{\sin 2\theta}{2}\right]^{\pi/6}$

$= \frac{\sqrt{3}}{2} + 2\left[\frac{\pi}{6} - \frac{1}{2}\cdot\frac{\sqrt{3}}{2}\right] = \frac{\pi}{3}$

95. (B) Given equation of curves



$y = \tan x$ ..... (i)

and $y = 0$ and $x = \frac{\pi}{4}$ ..... (ii)

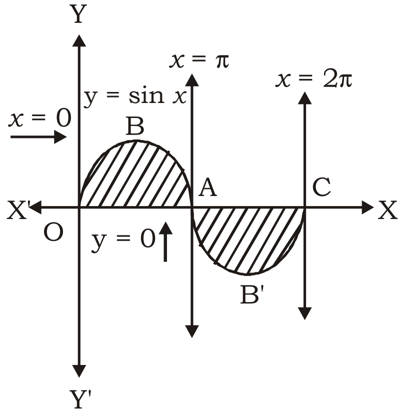
$\therefore$ Required area $= \int_{0}^{\pi/4} y\,dx$

$= \int_{0}^{\pi/4}\tan x\,dx = [\log|\sec x|]_{0}^{\pi/4}$

$= \log\left|\sec\frac{\pi}{4}\right| - \log|\sec\theta| = \log\left|\sqrt{2}\right| - \log|1|$

$= \log\sqrt{2} - 0 = \frac{1}{2}\log 2$ sq units

96. (C)



Required area (OBAB'C) $= \int_{0}^{\pi}\sin x\,dx + \int_{\pi}^{2\pi} -\sin x\,dx$

$= [-\cos x]_{0}^{\pi} + [\cos x]_{\pi}^{2\pi}$

$= -(\cos\pi - \cos 0) + (\cos 2\pi - \cos\pi)$

$= -(-1-1) + (1+1) = 4$ sq units

97. (C) The equations of curves are

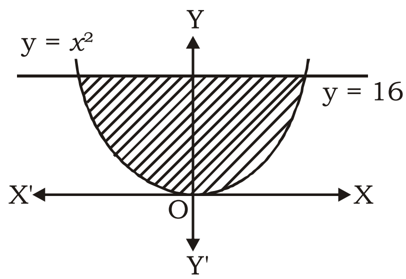
$y = x^2$ ..... (i)

and $y = 16$ ..... (ii)

On solving Eqs. (i) and (ii), we get

$x = 4, -4$

So, the points of intersection are (4, 16) and (– 4, 16).



Required area $= \int_{-4}^{4}(16 - x^2)\,dx$

$= 2\int_{0}^{4}(16 - x^2)\,dx$

$= 2\left[16x - \frac{x^3}{3}\right]_0^4 = 2\left[64 - \frac{64}{3}\right]$

$= \frac{128\times 2}{3} = \frac{256}{3}$ sq units

98. (A) Putting, y = vx,

$$v + x\frac{dv}{dx} = 1 + v + v^2$$

$$\Rightarrow \frac{dv}{1+v^2} = \frac{dx}{x} \Rightarrow \tan^{-1} v = \log x + C$$

$$\therefore \tan^{-1}\left(\frac{y}{x}\right) = \log x + C$$

99. (D) Put $x + y = v \Rightarrow \frac{dv}{dx} - 1 = \frac{dy}{dx}$

$$\therefore \frac{dv}{dx} = 1 + \sin v + \cos v$$

$$\Rightarrow \frac{dv}{2\cos^2\frac{v}{2} + 2\sin\frac{v}{2}\cdot\cos\frac{v}{2}} = dx$$

$$\Rightarrow \frac{\frac{1}{2}\sec^2\frac{v}{2}}{1+\tan\frac{v}{2}} dv = dx \Rightarrow \log\left(1+\tan\frac{x+y}{2}\right) = x + C$$

100. (B) We have $x^2ydy - (xdy - ydx) = 0$
or it can be rewritten as
$ydy - xdy + x^2ydy = 0$ .....(i)
On dividing Eq. (i) by x^2, we get

$$\frac{ydx - xdy}{x^2} + ydy = 0$$

$$\Rightarrow -d\left(\frac{y}{x}\right) + ydy = 0$$

On integrating both sides, we get

$$-\frac{y}{x} + \frac{y^2}{2} = C$$

$xy^2 - 2y = 2Cx$

101. (A) Given differential equation is

$$x\frac{dy}{dx} + y = 0 \Rightarrow x\frac{dy}{dx} - y$$

$$\Rightarrow -\frac{dy}{y} = \frac{dx}{x} \Rightarrow \int\frac{dx}{x} + \int\frac{dy}{y} = 0$$

On integrating both sides, we get
$\log x + \log y = \log C$
$\Rightarrow \log(xy) = \log C \Rightarrow xy = C$
Alternate Method

$$\frac{xdy}{dx} + y = 0 \qquad \Rightarrow xdy + y\,dx = 0$$

$\Rightarrow$ $d(xy) = 0$
$\therefore$ $xy = C$

102. (C) Given, $x^2 dy + y^2 dx = 0 \Rightarrow \frac{dy}{y^2} + \frac{dx}{x^2} = 0$

On integrating, we get

$$\int y^{-2}dy + \int x^{-2}dx = 0$$

$$\Rightarrow \frac{y^{-2+1}}{-2+1} + \frac{x^{-2+1}}{-2+1} = -C_1$$

$$\Rightarrow \frac{y^{-1}}{-1} + \frac{x^{-1}}{-1} = C_1 \Rightarrow \frac{-1}{y} - \frac{1}{x} = C_1$$

$$\Rightarrow \frac{1}{x} + \frac{1}{y} = C_1 \Rightarrow x + y = C_1 xy$$

$$\Rightarrow \frac{1}{C_1}(x + y) = xy$$

$$\therefore C(x + y) = xy, \text{ where } \frac{1}{C_1} = C$$

103. (D) Given equation can be rewritten as

$$\frac{xdy - ydx}{y^2} = x\,dx$$

$$\Rightarrow -d\left(\frac{x}{y}\right) = x\,dx$$

On inegrating both sides, we get

$$-\frac{x}{y} = \frac{x^2}{2} - \frac{C}{2}$$

$\therefore$ $x^2 + 2xy^{-1} = C$

104. (D) Given, A (2, 3), B (5, 6),C (8, λ,), O (1, 1)
$\therefore$ AB = OB – OA = (5, 6) – (2, 3) = (3,3)
Similarly, BC = 3, λ – 6
Since, A, B and C are collinear,
AB = p BC
$\therefore$ (3i + 3j) = p [3i + (λ – 6) j]
On comparing both sides, we get
3 = 3 p
$\therefore$ p = 1 and 3 = p (λ – 6) = λ – 6
$\therefore$ λ = 9

105. (A) a is perpendicular to both b and c and hence it is parallel to b × c.
$\therefore$ a = t (b × c)
On squaring both sides, we get all are unit vectors.

$$1 = t^2(1\cdot1 \sin 30°)^2 \cdot 1 = t^2\cdot\frac{1}{4}$$

$\therefore$ $t = \pm 2$

106. (C) Given that, |a|= |b|
(a) If (a + b) is prallel to (a – b)

Then, (a + b) × (a – b) should be equal to zero.

∴ (a + b) × (a – b) = a × a + b × a – a × b – b × b = 0 – a × b – a × b – 0

= – 2a × b ≠ 0

(b) (a + b) · (a – b) = a · a + b · a – a · b – b · b

= 1 + a · b – a · b – 1 = 0 ≠ 1

i.e., (a + b) is perpendicular to (a – b).

107. (C) Arithmetic mean of the squares of the first 'n' natural numbers

$$= \frac{1^2 + 2^2 + 3^2 + ... + n^2}{n}$$

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

108. (D) According to question,

$$\sum_{i=1}^{20}(x_i - 30) = 2 \quad \text{(given)}$$

$$\Rightarrow \sum_{i=1}^{20} x_i - 600 = 2 \Rightarrow \sum_{i=1}^{20} x_i = 602$$

$$\therefore \text{ Mean} = \frac{\sum_{i=1}^{20} x_i}{20} = \frac{602}{20} = 30.1$$

109. (C) Let, A, B, C be the section of class having 30, 30 and 40 students respectively.

Also given, the students of each section securing the Arithmetic means of the marks 72.2, 69.0 and 64.1 respectively.

Now, the total marks secured by the students of section A = 30 × 72.2 = 2166

The total marks secured by the students of sections B

= 30 × 69 = 2070

and the total marks secured by the students of sections C = 40 × 64.1 = 2564

So, the arithmetic mean of marks of all the students of three sections

$$= \frac{2166 + 2070 + 2564}{100} = \frac{6800}{100} = 68$$

110. (D) Since, lines of regression passes though $(\bar{x}, \bar{y})$.

∴ $3\bar{x} + \bar{y} - 12 = 0$ ..... (i)

and $\bar{x} + 2\bar{y} - 14 = 0$ ....(ii)

On solving Eqs. (i) and (ii), we get

$\bar{x} = 2$ and $\bar{y} = 6$

111. (B) ∵ P(A) = 0.6, P(B) = 0.7

Here, A and B are independent events.

∴ P (A ∩ B) = P(A) × P(B)

= 0.6 × 0.7 = 0.42

$P(\bar{A} \cap \bar{B}) = P(\bar{A}) \times P(\bar{B})$

= 0.4 × 0.3 = 0.12

Since, probability that A and B describe single event.

Probability that both speak truth or false

= $P(A \cap B) + P(\bar{A} \cap \bar{B})$

= 0.42 + 0.12 = 0.54

112. (B) Given that, in a binomial distribution, the occurrence and the non-occurrence of an event are equally likely.

i.e, $p = q = \frac{1}{2}$

and mean of Binomial distribution = np = 6

$\Rightarrow n \times \frac{1}{2} = 6 \Rightarrow n = 12$

So, the required number of trials is 12.

113. (D) Probability of getting head in a single toss,

$P(H) = \frac{1}{2}$

Probability of getting tail in a single toss,

$P(T) = \frac{1}{2}$

∴ Required probability = P (HHHHT or TTTTH)

= P (HHHHT) + P(TTTTH)

= P(H) · P(H) · P(H) · P(H) · P(T)

+ · P(T) · P(T) · P(T) · P(T)· P(H)

$$= \left(\frac{1}{2}\right)\left(\frac{1}{2}\right)\left(\frac{1}{2}\right)\left(\frac{1}{2}\right) + \left(\frac{1}{2}\right)\left(\frac{1}{2}\right)\left(\frac{1}{2}\right)\left(\frac{1}{2}\right)\left(\frac{1}{2}\right)$$

$$= 2 \times \frac{1}{32} = \frac{1}{16}$$

114. (B) Favourable numbers = [222, 444, 666, 888]

Total digit numbers = 4 × 5× 5

∴ Required probability = $\frac{4}{4 \times 25} = \frac{1}{25}$

115. (D) Given p, q, r ∈ z^+

and ω is the cube root of unity.

Then, $f(x) = x^{3p} + x^{3q+1} + x^{3r+2}$

$$\Rightarrow f(\omega) = \omega^{3p} + \omega^{3q+1} + \omega^{3r+2} \quad \left\{\begin{matrix} \omega^3 = 1 \\ and\, 1 + \omega + w^2 = 0 \end{matrix}\right\}$$

$= (1)^p + (1)^q \cdot \omega + (1)^r \cdot \omega^2 = 1 + \omega + \omega^2 = 0$

116. (C) A. $\left[\frac{-1+\sqrt{-3}}{29}\right]^{29} \therefore + \left[\frac{-1-\sqrt{-3}}{29}\right]^{29}$

$$= \left[\frac{-1 + \sqrt{3}\,i}{2}\right]^{29} + \left[\frac{-1 - \sqrt{3}i}{2}\right]^{29}$$

$= \omega^2 + \omega = -1$

R. $\omega^2 \neq -1$

Therefore, A is true but R is false.

117. (D) A. M = $\begin{bmatrix} 5 & 10 \\ 4 & 8 \end{bmatrix}$

$|M| = \begin{bmatrix} 5 & 10 \\ 4 & 8 \end{bmatrix} = 40 - 40 = 0$

So, M is not invertible.

R. M is singular matrix.

Therefore, is A is false and R is true.

118. (A) A. $\int \frac{e^x}{x}(1 + x \log x)\, dx =$

$$\int \frac{e^x}{x} dx \int e^x \log x\, dx$$

$= e^x \log x - \int e^x \log x\, dx + \int e^x \log x\, dx$

$= e^x \log x + C$

$\int e^x \left[f(x) + f'(x)\right] dx = \int e^x f(x)\, dx + \int e^x f(x)\, dx$

$= e^x f(x) + C$

Therefore, both A and R are true but R is the correct explanation of A.

119. (D) $\frac{dy}{dx} = 5x^2 (x-1)(x-3) = 0$

$\Rightarrow x = 0, 1, 3$

$\frac{d^2y}{dx^2} = 10x(2x^2 - 6x + 3)$

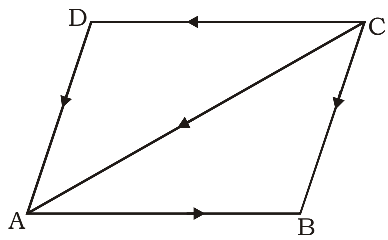
At $x = 1$, $\frac{d^2y}{dx^2} = < 0$, maxima

At $x = 3$, $\frac{d^2y}{dx^2} = > 0$, minima

At $x = 0$, $\frac{d^2y}{dx^2} = 0$ and $\frac{d^3y}{dx^3} \neq 0$

Neither maxima nor minima.

120. (D) In DACD,



CD + DA = CA .... (i)

Now, in ΔABC,

CA + AB = CB .... (ii)

From Eqs. (i) and (ii),

CD + DA + AB = CB

$\Rightarrow$ CB + CD + DA + AB = 2 CB

NDA (MATHS) MOCK TEST - 41 (Answer Key)

1. (A)	21. (B)	41. (C)	61. (A)	81. (A)	101. (A)
2. (C)	22. (A)	42. (A)	62. (B)	82. (B)	102. (C)
3. (A)	23. (B)	43. (D)	63. (A)	83. (C)	103. (D)
4. (A)	24. (C)	44. (A)	64. (C)	84. (A)	104. (D)
5. (B)	25. (B)	45. (A)	65. (B)	85. (D)	105. (A)
6. (B)	26. (C)	46. (D)	66. (A)	86. (C)	106. (C)
7. (D)	27. (C)	47. (C)	67. (A)	87. (C)	107. (C)
8. (B)	28. (C)	48. (D)	68. (D)	88. (D)	108. (D)
9. (A)	29. (A)	49. (C)	69. (B)	89. (D)	109. (C)
10. (A)	30. (A)	50. (A)	70. (A)	90. (A)	110. (D)
11. (C)	31. (C)	51. (A)	71. (A)	91. (A)	111. (B)
12. (A)	32. (B)	52. (B)	72. (A)	92. (B)	112. (B)
13. (B)	33. (D)	53. (D)	73. (C)	93. (B)	113. (D)
14. (A)	34. (B)	54. (D)	74. (C)	94. (C)	114. (B)
15. (A)	35. (A)	55. (B)	75. (D)	95. (B)	115. (D)
16. (D)	36. (A)	56. (C)	76. (A)	96.(C)	116. (C)
17. (C)	37. (C)	57. (C)	77. (B)	97. (C)	117. (D)
18. (C)	38. (B)	58. (B)	78. (B)	98. (A)	118. (A)
19. (A)	39. (D)	59. (A)	79. (C)	99. (D)	119. (D)
20. (D)	40. (C)	60. (B)	80. (C)	100. (B)	120. (D)

Note:- If you face any problem regarding result or marks scored, please contact 9313111777

Note:- If your opinion differs regarding any answer, please message the mock test and question number to 8860330003