NDA MATHS MOCK TEST - 76 (SOLUTION)

1. (B) Set of odd natural numbers divisible by 2 is null set.
set of even prime number = {2}
{x : x is a natural number $x < 3$ and $x > 6$} is null set.

2. (C) sin20° sin40°sin60° sin80°
$\Rightarrow$ sin 60° [sin 20° sin 40° sin 80°]

$$\Rightarrow \frac{\sqrt{3}}{2}\left[\frac{1}{4}\sin(3\times 20)\right]$$

$$\left[\because \sin\theta\sin(60-\theta).\sin(60+\theta) = \frac{1}{2}\sin 3\theta\right]$$

$$\Rightarrow \frac{\sqrt{3}}{2} \times \frac{1}{4} \times \frac{\sqrt{3}}{2}$$

$$\Rightarrow \frac{3}{16}$$

3. (D) $I = \int \frac{1-\log x}{x^2\cos^2\left(\frac{\log x}{x}\right)}\, dx$

Let $\frac{\log x}{x} = t$

$$\frac{1-\log x}{x^2}dx = dt$$

$$I = \int \frac{1}{\cos^2 t}\, dt$$

$$I = \int \sec^2 t\, dt$$

$I = \tan t + c$

$$I = \tan\left(\frac{\log x}{x}\right) + c$$

4. (A) Formula

$$\int \sec x\, dx = \log(\sec x + \tan x) + c$$

5. (D) $y = \sqrt{\sin x - \sqrt{\sin x - \sqrt{\sin x ...}}}$

$$y = \sqrt{\sin x - y}$$

on squaring
$y^2 = \sin x - y$
$y^2 + y = \sin x$
On differentiating both side w.r.t. 'x'

$$2y\frac{dy}{dx} + \frac{dy}{dx} = \cos x$$

$$(2y+1)\frac{dy}{dx} = \cos x$$

$$\frac{dy}{dx} = \frac{\cos x}{1+2y}$$

6. (C) $y = 2x\sqrt{1-x^2}$
on differencing both side w.r.t 'x'

$$\frac{dy}{dx} = 2\left[x.\frac{(-2x)}{2\sqrt{1-x^2}} + \sqrt{1-x^2}.1\right]$$

$$\frac{dy}{dx} = 2\left[\frac{1-2x^2}{\sqrt{1-x^2}}\right]$$

7. (B) $\begin{vmatrix} k & a+b & a^2+b^2 \\ k & b+c & b^2+c^2 \\ k & c+a & c^2+a^2 \end{vmatrix} = (a-b)(b-c)(c-a)$

$$\Rightarrow k\begin{vmatrix} 1 & a+b & a^2+b^2 \\ 1 & b+c & b^2+c^2 \\ 1 & c+a & c^2+a^2 \end{vmatrix} = (a-b)(b-c)(c-a)$$

$R_2 \to R_2 - R_1$, $R_3 \to R_3 - R_1$

$$\Rightarrow k\begin{vmatrix} 1 & a+b & a^2+b^2 \\ 0 & c-a & c^2-a^2 \\ 0 & c-b & c^2-b^2 \end{vmatrix} = (a-b)(b-c)(c-a)$$

$$\Rightarrow k(c-a)(c-b)\begin{vmatrix} 1 & a+b & a^2+b^2 \\ 0 & 1 & c+a \\ 0 & 1 & c+b \end{vmatrix}$$

$= (a-b)(b-c)(c-a)$

$$\Rightarrow -k(c-a)(b-c)\begin{vmatrix} 1 & a+b & a^2+b^2 \\ 0 & 1 & c+a \\ 0 & 1 & c+b \end{vmatrix}$$

$= (a-b)(b-c)(c-a)$
$\Rightarrow -k[1(c+b-c-a) - (a+b)(0) + (a^2+b^2)(0)] = (a-b)$
$\Rightarrow -k(b-a) = (a-b)$
$\Rightarrow -k(a-b) = (a-b)$
$k = 1$

8. (A) 2-digits number formed from the digits (1, 2, 3, 4, 5, 6, 7, 8, 9)

9	9

$= 9 \times 9 = 81$

3 digits number less than 500

| 4 | 9 | 9 | $= 4 \times 9 \times 9 = 324$

because only {1, 2, 3, 4} can put here.

number formed lying between 10 and 500
= 81 + 324 = 405

9. (B) 1 1 0 1 0 1 0 1

$1 \times 2^0 = 1$
$0 \times 2^1 = 0$
$1 \times 2^2 = 4$
$0 \times 2^3 = 0$
$1 \times 2^4 = 16$
$0 \times 2^5 = 0$
$1 \times 2^6 = 64$
$1 \times 2^7 = 128$
213

$(11010101)_2 = (213)_{10}$

0 0 1

$0 = 0 \times 2^{-1}$
$0 = 2 \times 2^{-2}$
$\frac{1}{8} = 1 \times 2^{-3}$
0.125

$(0.001)_2 = (0.125)_{10}$
then $(11010101.001)_2 = (213.125)_{10}$

10. (D) $2^x + 2^y = 2^{x+y}$
On differentiating both side w.r.t. 'x'

$$2^x \log 2 + 2^y \log 2 \frac{dy}{dx} = 2^{x+y} \log 2 \left(1 + \frac{dy}{dx}\right)$$

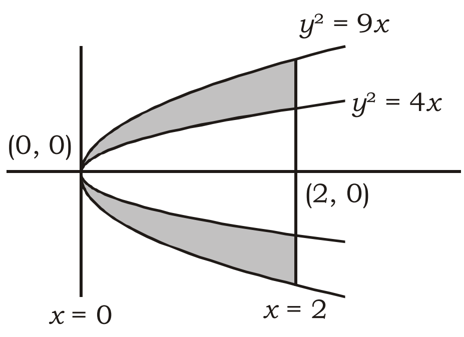
$$(2^y - 2^{x+y}) \frac{dy}{dx} = 2^{x+y} - 2^x$$

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

$$\frac{dy}{dx} = \frac{2^y}{-2^x} \text{ [from equation ...(i)]}$$

$$\frac{dy}{dx} = -2^{y-x}$$

11. (C)



Parabolas $y_1 \Rightarrow y = 3\sqrt{x}$

$y_2 \Rightarrow y = 2\sqrt{x}$

and line $x = 2$

$$\text{Area} \Rightarrow 2\int_0^2 (y_1 - y_2)\, dx$$

$$\Rightarrow 2\int_0^2 \left(3\sqrt{x} - 2\sqrt{x}\right) dx$$

$$= 2\int_0^2 \sqrt{x}\, dx$$

$$= 2 \times \frac{2}{3}\left[x^{\frac{3}{2}}\right]_0^2$$

$$= \frac{4}{3}\left[2^{\frac{3}{2}} - 0\right]$$

$$= \frac{4}{3} \times 2\sqrt{2}$$

$$= \frac{8\sqrt{2}}{3}$$

12. (C) S = {(HHH), (HTT), (HHT), (HTH), (THT), (THH), (TTH), (TTT)}

$n(S) = 8$

E = {(HHT), (HTH), (THH), (HHH)}

$n(E) = 4$

$$P(E) = \frac{n(E)}{n(S)} = \frac{4}{8} = \frac{1}{2}$$

13. (A) Probability of getting first card is an ace

$= \frac{4}{52}$

Probability of getting second card without replacement is an ace $= \frac{3}{51}$

Required Probability P(E) $= \frac{4}{52} \times \frac{3}{51} = \frac{1}{221}$

14. (B) Probability of 5 Friday in July $= \frac{3}{7}$

15. (C) ELEPHANT

(LPHNT) EEA

as a one letter

LPHNT

total arrangement $= \frac{4!}{2!} \times 5!$

= 1440

16. (D) In expansion of $\left(\frac{3}{2}x^2 + \frac{1}{4x}\right)^7$

general term

$$T_{r+1} = {}^7C_r \left(\frac{3}{2}x^2\right)^{7-r} \left(\frac{1}{4x}\right)^r$$

$$= {}^7C_r \left(\frac{3}{2}\right)^{7-r} x^{14-3r} \left(\frac{1}{4}\right)^r$$

$$= 14 - 3r = 0$$

$$r = \frac{14}{3}$$

Which is not possible.
Thus, no such term exists in the expansion of the given expression.

17. (B) $\begin{vmatrix} b^2-ab & b-c & bc-ac \\ ab-a^2 & a-b & b^2-ab \\ bc-ac & c-a & ab-a^2 \end{vmatrix}$

$$= \begin{vmatrix} b(b-a) & b-c & c(b-a) \\ a(b-a) & a-b & b(b-a) \\ c(b-a) & c-a & a(b-a) \end{vmatrix}$$

$$= (b-a)(b-a)\begin{vmatrix} b & b-c & c \\ a & a-b & b \\ c & c-a & a \end{vmatrix}$$

$C_2 \to C_2 + C_3$

$$\Rightarrow (b-a)(b-a)\begin{vmatrix} b & b & c \\ a & a & b \\ c & c & a \end{vmatrix}$$

$\Rightarrow 0$ [$\because$ two columns are identical.]

18. (C) $\begin{vmatrix} a & b & a+b \\ b & a & b+c \\ a-b & c-b & 0 \end{vmatrix}$

$C_1 \to C_1 + C_2$

$$\Rightarrow \begin{vmatrix} a+b & b & a+b \\ b+c & c & b+c \\ a+c-2b & c-b & 0 \end{vmatrix}$$

$$\Rightarrow \begin{vmatrix} a+b & b & a+b \\ b+c & c & b+c \\ 0 & c-b & 0 \end{vmatrix} \quad \left[\begin{array}{l}\because a, b, c, \text{are in A.P.} \\ \text{then } 2b = a + c\end{array}\right]$$

$\Rightarrow 0$ [$\because$ two columns are identical.]

19. (B)

20. (C)

$$A = \begin{bmatrix} -1 & 0 & 0 \\ 0 & -1 & 0 \\ 0 & 0 & -1 \end{bmatrix}$$

$$A = -1\begin{bmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{bmatrix}$$

$A = (-1)I$

21. (A) $\log_{10}\frac{3}{4} - \log_{10}\frac{10}{3} + \log_{10}\frac{5}{9}$

$$\Rightarrow \log_{10}\left(\frac{\frac{3}{4}}{\frac{10}{3}}\right) + \log_{10}\frac{5}{9} \quad \left[\because \log m - \log n = \log\frac{m}{n}\right]$$

$$\Rightarrow \log_{10}\left(\frac{9}{40}\right) + \log_{10}\left(\frac{5}{9}\right)$$

$$\Rightarrow \log_{10}\left(\frac{9}{40} \times \frac{5}{9}\right)$$

$$\Rightarrow \log_{10}\left(\frac{1}{8}\right) = 3 \log 2$$

$= -3 \times 0.3010$

$= -0.9030$

22. (A) General term of G.P.

$T_n = ar^{n-1}$

Given that

$T_7 = ar^6 = 16$ ...(i)

$T_3 = ar^2 = 9$ ...(ii)

from equation (i) and equation (ii)

$$r^4 = \frac{16}{9} \Rightarrow r^2 = \frac{4}{3}$$

from equation (i) and equation (ii)

$ar^6 \times ar^2 = 16 \times 9$

$(ar^4)^2 = 144$

$ar^4 = 12$

$$a \times \frac{16}{9} = 12$$

$$a = \frac{27}{4}$$

9th term $= T_9 = ar^8$

$$= \frac{27}{4} \times \left(\frac{16}{9}\right)^2$$

$$= \frac{64}{3}$$

23. (B) We know that

$$1^2 + 2^2 + 3^2 \ldots + n^2 = \frac{n}{6}(n+1)(2n+1)$$

then

$$11^2 + 12^2 + 13^2 + \ldots + 20^2$$

$$\Rightarrow (1^2 + 2^2 + 3^2 + \ldots 11^2 + 12^2 \ldots + 20^2) - (1^2 + 2^2 + 3^2 + \ldots + 10^2)$$

$$\Rightarrow \frac{20}{6}(21) \times (41) - \frac{10}{6} \times (11) \times (21)$$

$$\Rightarrow \frac{21}{6}(20 \times 41 - 10 \times 11)$$

$$\Rightarrow \frac{7}{2}(820 - 110)$$

$$\Rightarrow \frac{7}{2} \times 710$$

$\Rightarrow 7 \times 710$

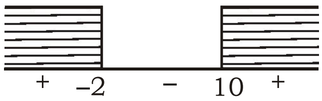
$\Rightarrow 7 \times 355$

$\Rightarrow 2485$

24. (A) $x^2 - 8x - 20 \geq 0$

$(x - 10)(x + 2) \geq 0$

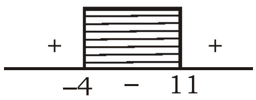
$x = 10, -2$



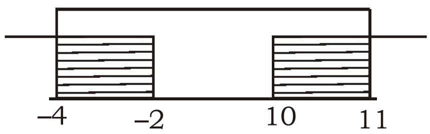
and $x^2 - 7x - 44 \leq 0$

$(x - 11)(x + 4) \leq 0$

$x = 11, -4$



general solution



$x \in [-4, -2] \cup [10, 11]$

$-4 \leq x \leq -2$ or $10 \leq x \leq 11$

25. (D) $I = \int \frac{dx}{x^2 + 6x + 13}$

$$= \int \frac{dx}{(x+3)^2 + 4}$$

$$= \int \frac{dx}{(x+3) + (2)^2}$$

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

$$\left[\because \int \frac{1}{x^2 + a^2}dx = \frac{1}{a}\tan^{-1}\frac{x}{a}\right]$$

26. (C) A polygon has ($n = 12$) sides

$$\text{then number of diagonals} = \frac{n(n-3)}{2}$$

$$= \frac{12 \times 9}{2}$$

$= 54$

27. (B) $(2 + 2\omega - 2\omega)^{23}$

$\Rightarrow [2(1 + \omega) - 2\omega^2]^{23}$

$\Rightarrow [2(-\omega^2) - 2\omega^2]^{23}$ $[\because 1 + \omega + \omega^2 = 0]$

$\Rightarrow (-4\omega^2)^{23}$

$\Rightarrow -4^{23}\,\omega^{46}$

$\Rightarrow -4^{23}\omega$ $[\because \omega^3 = 1]$

$\Rightarrow -2^{46}\omega$

28. (B) $\cos\left[\cos^{-1}\frac{4}{5} + 2\tan^{-1}\frac{1}{3}\right]$

$$\Rightarrow \cos\left[\cos^{-1}\frac{4}{5} + \tan^{-1}\left(\frac{\frac{2}{3}}{1 - \left(\frac{1}{2}\right)^2}\right)\right]$$

$$\left[\therefore 2\tan^{-1}x = \tan^{-1}\frac{2x}{1 - x^2}\right]$$

$$\Rightarrow \cos\left[\cos^{-1}\frac{4}{5} + \tan^{-1}\left(\frac{3}{4}\right)\right]$$

$$\Rightarrow \cos\left[\tan^{-1}\frac{3}{4} + \tan^{-1}\frac{3}{4}\right]$$

$$\left[\because \cos^{-1}x = \tan\frac{\sqrt{1 - x^2}}{x}\right]$$

$$\Rightarrow \cos\left[2\tan^{-1}\frac{3}{4}\right]$$

$$\Rightarrow \cos\left[\tan^{-1}\frac{24}{7}\right] \quad \left[\because 2\tan^{-1}x = \tan^{-1}\frac{2x}{1 - x^2}\right]$$

$$\Rightarrow \cos\left(\cos^{-1}\frac{7}{25}\right)$$

$$\Rightarrow \frac{7}{25}$$

29. (C) $\text{Sin}\,(1305)^\circ = \sin(4 \times 360 - 135)$

$= -\sin 135$

$= -\cos 45^\circ$

$$= -\frac{1}{\sqrt{2}}$$

30. (A) cos 420°sin 390° + sin (– 300°) . cos (–330°)

$\Rightarrow \cos(360+60)\sin(360+30) - \sin(360-60)\cos(360-30)$

$\Rightarrow \cos 60 \sin 30 + \sin 60 \cos 30$

$\Rightarrow \cos(30+60)$

$[\because \sin(A+B) = \sin A.\cos B + \cos A.\sin B]$

$\Rightarrow \sin 90$

$\Rightarrow 1$

31.(B) Sphere $x^2 + y^2 + z^2 - 3x + 6y - z + 8 = 0$

on comparing with general equation

$x^2 + y^2 + z^2 + 2ux + 2vy + 2wz + k = 0$

$u = \frac{-3}{2}$, $v = 3$, $w = \frac{-1}{2}$

and plane $2x - 4y - 4z + 6 = 0$

$a = 2,\ b = -4,\ c = -4,\ d = 6$

radius of the sphere = $\left|\frac{-au - bv - cw + d}{\sqrt{a^2+b^2+c^2}}\right|$

$$= \left|\frac{-2\times\left(\frac{-3}{2}\right) - (-4)\times 3 - (-4)\times\left(\frac{-1}{2}\right) + 6}{\sqrt{(-2)^2+(-4)^2+(-4)^2}}\right|$$

$= \frac{19}{6}$

32. (B) given that focus of ellipse = (0, –4) and directrix $x + 3y + 4 = 0$

eccentricity $(e) = \frac{1}{\sqrt{2}}$

We know that

SP = e PM

$$\sqrt{(x-0)^2+(y+4)^2} = \frac{1}{\sqrt{2}}\left|\frac{x+3y+4}{\sqrt{(1)^2+(3)^2}}\right|$$

on squaring both side

$x^2 + y^2 + 16 + 8y = \frac{1}{2}$

$$\left[\frac{x^2+9y^2+16+6xy+24y+8x}{10}\right]$$

On solving

$19x^2 + 11y^2 - 6xy - 8x + 136y + 304 = 0$

33. (A) Ellipse

$$\frac{(x-3)^2}{25} + \frac{(y-4)^2}{9} = 1$$

$a^2 = 25,\ b^2 = 9$

$a = 5,\ b = 3$

$\frac{X^2}{25} + \frac{Y^2}{9} = 1$ ...(i) where $X = x - 3$

$Y = y - 4$

parameter of the ellipse $(a \sin\phi, b\cos\phi)$

then $X = a\sin\phi,\ Y = b\cos\phi$

$x - 3 = 5\sin\phi,\ y - 4 = 3\cos\phi$

$x = 5\sin\phi + 3,\ y = 3\cos\phi + 4$

The point of the ellipse is $(5\sin\phi + 3, 3\cos\phi + 4)$.

34. (A) $2(1 - e^x)\, y\, dy = e^x\, dx$

$$2y\,dy = \frac{e^x}{1-e^x}\,dx$$

on integrating

$$2\int y\,dy = -\int \frac{(-e^x)}{1-e^x}\,dx$$

$$\frac{2y^2}{2} = -\log(1-e^x) + \log(c)$$

$$y^2 = \log\left(\frac{c}{1-e^x}\right)$$

35. (B) Mean (A) = 30, h = 15 – 15 = 10

Class Interval	f_i	x_i	$d_i = \frac{x_i - 30}{10}$	$f_i d_i$	d_i^2	$f_i d_i^2$
5-15	8	10	–2	–16	4	32
15-25	12	20	–1	–12	1	12
25-35	15	**30**	0	0	0	0
35-45	9	40	1	9	1	9
45-55	6	50	2	12	4	24
	$\Sigma f_i = 56$			$\Sigma f_i d_i = -7$		$\Sigma f_i d_i^2 = 77$

Standard deviation $(\sigma) = h\sqrt{\frac{\Sigma f_i d_i^2}{\Sigma f_i} - \left(\frac{\Sigma f_i d_i}{\Sigma f_i}\right)^2}$

$= 10\sqrt{\frac{77}{50} - \left(\frac{-7}{50}\right)^2}$

$= 10\sqrt{\frac{77}{50} - \frac{49}{2500}}$

$= 10\sqrt{\frac{3801}{2500}}$

$= 12.33$

36. (C) Given data 2, 4, 8, 7, 9, 8, 8, 4, 3, 1

Mean $\overline{X} = \frac{2+4+8+7+9+8+8+4+3+1}{10}$

$= \frac{54}{10} = 5.4$

Mean deviation $= \frac{\sum|X-\overline{X}|}{n}$

$= \frac{|2-5.4|+|4-5.4|+|8-5.4|+|7-5.4|+|9-5.4|+|8-5.4|+|8-5.4|+|4-5.4|+|3-5.4|+|1-5.4|}{10}$

$= \frac{3.4+1.4+2.6+1.6+3.6+2.6+2.6+1.4+2.4+4.4}{10}$

$= \frac{26.0}{10} = 2.6$

37. (A) Straight line $\frac{x-3}{2} = \frac{y-5}{4} = \frac{z-3}{5}$ is parallel to the plane but perpendicular to its normal.

Then condition

$a_1a_2 + b_1b_2 + c_1c_2 = 0$

from option (a) : plane $4x + 3y - 4z = 0$

$2 \times 4 + 4 \times 3 - 5 \times 4 = 0$

$8 + 12 - 20 = 0$

$0 = 0$

Hence plane $4x + 3y - 4z = 0$ is parallel to the straight line.

38. (A) Centre $C(3, -1, 2)$ and point $P(4, 2, 4)$

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

$= \sqrt{1+9+4}$

$= \sqrt{14}$

equation of the sphere

$(x-3)^2 + (y+1)^2 + (z-2)^2 = (\sqrt{14})^2$

$x^2 + 9 - 6x + y^2 + 1 + 2y + z^2 + 4 - 4z = 14$

$x^2 + y^2 + z^2 - 6x + 2y - 4z = 0$

39. (C) $(x+1)^2 = 4(y-3)$

$X^2 = 4Y$ where $X = x + 1$

$4a = 4$ $Y = y - 3$

$a = 1$

equation of directrix

$Y = -a$

$y - 3 = -1$

$y = 2$

40. (B) Given that $x = 8\sec\theta$, $y = 4\tan\theta$

$\sec\theta = \frac{x}{8}$, $\tan\theta = \frac{y}{4}$

$\sec^2\theta - \tan^2\theta = \frac{x^2}{64} - \frac{y^2}{16}$

$1 = \frac{x^2}{64} - \frac{y^2}{16}$

$\frac{x^2}{64} - \frac{y^2}{16} = 1$

$a = 8$, $b = 4$

$e = \sqrt{1+\frac{b^2}{a^2}}$

$e = \sqrt{1+\frac{16}{64}}$

$e = \frac{\sqrt{5}}{2}$

distance between the directrices $= \frac{2a}{e}$

$= \frac{2\times 8}{\sqrt{5}} \times 2$

$= \frac{32}{\sqrt{5}}$

41. (D) $I = \int_0^{\frac{\pi}{2}} \cos x \,.\sin^2 x\, dx$

Let $\sin x = t$ when $x \to 0$, $t \to 0$

$\cos x\, dx = dt$ $x \to \frac{\pi}{2}$, $t \to 1$

$I = \int_0^1 t^7\, dx$

$= \left[\frac{t^8}{8}\right]_0^1$

$= \frac{1}{8} - 0 = \frac{1}{8}$

42. (B) $P = \int e^x \cos x\, dx$ and $Q = \int e^x \sin x\, dx$

$\frac{dP}{dx} = e^x \cos x$ and $\frac{dQ}{dx} = e^x \sin x\, dx$

$P + Q = \int e^x \cos x dx + \int e^x \cos x\, dx$

$$= e^x.\int \cos x dx - \int \left\{\frac{d}{dx}(e^x).\int \cos x\right\} dx$$

$$+ \int e^x \sin x\, dx + c$$

$$= e^x. \sin x - \int e^x \sin x\, dx + \int e^x \sin x\, dx + c$$

$$P + Q = e^x .\sin x + c$$

$$P + Q = \frac{dQ}{dx} + c$$

43. (D) $I = \int\left[\text{cosech}^2 x + \frac{x^5\left(\tan^{-1} x^6\right)}{\left(1+x^{12}\right)}\right] dx$

let $\quad \tan^{-1} x^6 = t$

$$\frac{1}{1+x^{12}}\ 6x^5\, dx = dt$$

$$\frac{x^5}{1+x^{12}}\ dx = \frac{1}{6}\, dt$$

$$I = \coth x + \frac{1}{6}\int t\, dt$$

$$= \coth x + \frac{1}{6} \times \frac{t^2}{2} + c$$

$$= \coth x + \frac{1}{12}(\tan^{-1} x^6)^2 + c$$

44. (C) $I = \int e^{\log x \cos x}\, dx$

$$I = \int x \cos x\, dx$$

$$I = x.\int \cos x\, dx - \int\left\{\frac{d}{dx}(x).\int \cos x\, dx\right\} dx + c$$

$$I = x.\sin x - \int 1.\sin x\, dx + c$$

$$I = x \sin x + \cos x + c$$

45. (C) $I = \int_1^e (\log x)^2\, dx$

Let $\log x = t \Rightarrow x = e^t$ when $x \to 1,\ t \to 0$

$\frac{1}{x}\, dx = dt \qquad x \to e,\ t \to 1$

$$dx = x\, dt$$

$$dx = e^t\, dt$$

$$I = \int_0^1 t^2 .e^t\, dt$$

$$= \left[t^2 \int e^t dt - \int\left\{\frac{d}{dt}(t^2).\int e^t dt\right\}\right]_0^1$$

$$= \left[t^2.e^t - \int 2t.e^t dt\right]_0^1$$

$$= \left[t^2.e^t - 2\left\{t\int e^t dt - \int\left\{\frac{d}{dt}(t)\int e^t dt\right\}\right\}\right]_0^1$$

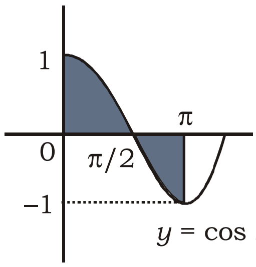
$$= \left[t^2 e^t - 2te^t + 2\int 1.e^t dt\right]_0^1$$

$$= \left[t^2 e^t - 2t.e^t + 2e^t\right]_0^1$$

$$= e. - 2 \times 1 \times e + 2.e - 0 + 0 - 2e^0$$

$$= e - 2$$

46. (A)



$$\text{Area} = \int_0^{\frac{\pi}{2}} y\, dx + \int_{\frac{\pi}{2}}^{\pi} (-y)\, dx$$

$$= \int_0^{\frac{\pi}{2}} \cos x\, dx - \int_{\frac{\pi}{2}}^{\pi} \cos x\, dx$$

$$= [\sin x]_0^{\frac{\pi}{2}} - [\sin x]_{\frac{\pi}{2}}^{\pi}$$

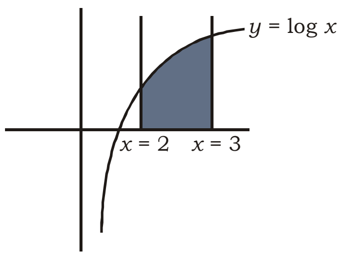
$$= \left(\sin\frac{\pi}{2} - \sin 0\right) - \left(\sin\pi - \sin\frac{\pi}{2}\right)$$

$$= (1 - 0) - (0 - 1)$$

$$= 1 + 1$$

= 2 square unit

47. (D)



$$y = \log x$$

$$\text{Area} = \int_2^3 y dx$$

$= \int_2^3 \log x\, dx$

$= \left[\log x \int 1.dx - \int \left\{\frac{d}{dx}(\log x).\int 1.dx\right\} dx\right]_2^3$

$= \left[x \log x - \int \frac{1}{x}.x\, dx\right]_2^3$

$= [x \log x - x]_2^3$

$= (3 \log 3 - 3) - (2 \log 2 - 2)$

$= 3 \log 3 - 3 - 2 \log 2 + 2$

$= \log 27 - \log 4 - 1$

$= \log\left(\frac{27}{4}\right) - 1$

48. (A) $\frac{dy}{dx} + y\left(\tan x + \frac{1}{x}\right) = \frac{1}{x} \sec x$

On comparing with general equation

$\frac{dy}{dx} + Py = Q$

$P = \tan x + \frac{1}{x}$, $Q = \frac{1}{x} \sec x$

$I.F. = e^{\int P dx}$

$= e^{\int\left(\tan x + \frac{1}{x}\right)dx}$

$I.F. = e^{(\log \sec x + \log x)}$

$I.F. = e^{\log(x.\sec x)}$

$= x.\sec x$

Solution of the differential equation

$y \times I.F. = \int Q \times I.F.\, dx$

$y \times x.\sec x = \int \frac{1}{x} \sec x \times x \sec x\, dx$

$xy \sec x = \int \sec^2 x\, dx$

$xy \sec x = \tan x + c$

$xy = \sin x + c.\cos x$

49. (C) Eccentricity $e = 2\sqrt{2}$

and distance between foci $= 2ae = 16$

$2a \times 2\sqrt{2} = 16$

$a = \frac{4}{\sqrt{2}}$

$a^2 = 8$

then

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

$8 = 1 + \frac{b^2}{8}$

$7 = \frac{b^2}{8}$

$b^2 = 56$

equation of hyperbola

$\frac{x^2}{8} - \frac{y^2}{56} = 1$

$7x^2 - y^2 = 56$

50. (D) parabola

$(y + 4)^2 = 8(x - 2)$

$Y^2 = 8X$ where $X = x - 2$

$4a = 8$ $Y = y + 4$

$a = 2$

Focus of parabola $(X, Y) = (a, 0)$

$X = a$ $Y = 0$

$x - 2 = 2$ $y + 4 = 0$

$x = 4$ $y = -4$

focus of parabola $= (4, -4)$

51. (B) Differential equation

$x\, dy - y\, dx = yx^2\, dy$

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

$d\left(\frac{y}{x}\right) = y\, dy$

On integrating

$\frac{y}{x} = \frac{y^2}{2} + c$

$2y = xy^2 + 2cx$

52. (A) $I = \int_{\frac{\pi}{6}}^{\frac{\pi}{3}} \frac{dx}{1 + \sqrt{\cot x}}$

$I = \int_{\frac{\pi}{6}}^{\frac{\pi}{3}} \frac{\sqrt{\sin x}}{\sqrt{\sin x} + \sqrt{\cos x}}$ ...(i)

$I = \int_{\frac{\pi}{6}}^{\frac{\pi}{3}} \frac{\sqrt{\cos x}}{\sqrt{\cos x} + \sqrt{\sin x}}$ ...(ii)

$\left[\because \int_a^b f(x)\,dx = \int_a^b f(a + b - x)\,dx\right]$

From equation (i) and (ii)

$2I = \int_{\frac{\pi}{6}}^{\frac{\pi}{3}} 1.dx$

$$2I = [x]_{\frac{\pi}{6}}^{\frac{\pi}{3}}$$

$$2I = \frac{\pi}{3} - \frac{\pi}{6}$$

$$2I = \frac{\pi}{6}$$

$$I = \frac{\pi}{12}$$

53. (B) $(x + y)(dx + dy) = dx - dy$

$(x + y)dx + (x + y)dy = dx - dy$

$(x + y + 1)dy = (1 - x - y)dx$

$$\frac{dy}{dx} = \frac{1-x-y}{x+y+1} \quad \ldots(i)$$

Let $x + y = t$

$$1 + \frac{dy}{dx} = \frac{dt}{dx}$$

$$\frac{dy}{dx} = \frac{dt}{dx} - 1$$

from equation (i)

$$\frac{dt}{dx} - 1 = \frac{1-t}{1+t}$$

$$\frac{dt}{dx} = \frac{2}{1+t}$$

$(1 + t)dt = 2dx$

On integrating

$$t + \frac{t^2}{2} = 2x + \frac{C}{2}$$

$2t + t^2 = 4x + C$

$2(x + y) + (x + y)^2 = 4x + C$

$(x + y)^2 = 2x - 2y + C$

54. (A) $$I = \int_{\frac{\pi}{6}}^{\frac{\pi}{3}} \frac{3^{\tan x}}{3^{\tan x} + 3^{\cot x}} dx \quad \ldots(i)$$

$$I = \int_{\frac{\pi}{6}}^{\frac{\pi}{3}} \frac{3^{\cot x}}{3^{\tan x} + 3^{\cot x}} dx \quad \ldots(ii)$$

$$\left[\because \int_a^b f(x)dx = \int_a^b f(a+b-x)dx\right]$$

On adding equation (i) and (ii)

$$2I = \int_{\frac{\pi}{6}}^{\frac{\pi}{3}} 1\,.dx$$

$$2I = [x]_{\frac{\pi}{6}}^{\frac{\pi}{3}}$$

$$2I = \frac{\pi}{3} - \frac{\pi}{6}$$

$$2I = \frac{\pi}{6} \Rightarrow I = \frac{\pi}{12}$$

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

on differentiating both side w.r.t. 'x'

$$\frac{dy}{dx} = \frac{1}{x+\sqrt{1+x^2}}\left[1 + \frac{1}{2\sqrt{1+x^2}}(2x)\right]$$

$$\frac{dy}{dx} = \frac{1}{x+\sqrt{1+x^2}}\left[\frac{\sqrt{1+x^2}+x}{\sqrt{1+x^2}}\right]$$

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

again, differentiating both side w.r.t. 'x'

$$\frac{d^2y}{dx^2} = \frac{-1}{2}(1+x^2)^{-\frac{3}{2}}(2x)$$

$$\frac{d^2y}{dx^2} = \frac{-x}{(1+x^2)^{\frac{3}{2}}}$$

56. (B) $$\text{L.H.L} = \lim_{x\to 2^-}\frac{(x-2)^2}{|x-2|} = \lim_{h\to 0}\frac{(2-h-2)^2}{|2-h-2|}$$

$$= \lim_{h\to 0}\frac{h^2}{h}$$

$$= \lim_{h\to 0} h = 0$$

$$\text{R.H.L} = \lim_{x\to 2^+}\frac{(x-2)^2}{|x-2|} = \lim_{h\to 0}\frac{(2+h-2)^2}{|2+h-2|}$$

$$= \lim_{h\to 0}\frac{h^2}{h}$$

$= 0$

L.H.L. = R.H.L. = 0

Hence $$\lim_{x\to 2}\frac{(x-2)^2}{|x-2|} = 0$$

57. (A) $$\lim_{x\to 0}\frac{a^{\sin x} - a^{\tan x}}{\tan\left(\frac{\pi}{4}-x\right) - \cot\left(\frac{\pi}{4}-x\right)} \quad \left[\frac{0}{0}\right] \text{ form}$$

by L-hospital's rule

$$\Rightarrow \lim_{x\to 0}\frac{a^{\sin x}.\log a.\cos x - a^{\tan x}.\log a.\sec^2 x}{-\sec^2\left(\frac{\pi}{4}-x\right) + \left(-\text{cosec}^2\left(\frac{\pi}{4}-x\right)\right)}$$

$$\Rightarrow \lim_{x\to 0} \frac{\log a\left(a^{\sin x}.\cos x - a^{\tan x}.\sec^2 x\right)}{-\sec^2\left(\frac{\pi}{4}-x\right)-\text{cosec}^2\left(\frac{\pi}{4}-x\right)}$$

$$\Rightarrow \frac{\log a\left(a^{\sin 0}.\cos 0 - a^{\tan 0}.\sec^2 0\right)}{-\sec^2\frac{\pi}{4}-\text{cosec}^2\frac{\pi}{4}}$$

$= 0$

58. (B) $\lim_{x\to\infty}\left(\frac{x+5}{x+2}\right)^{x+3}$

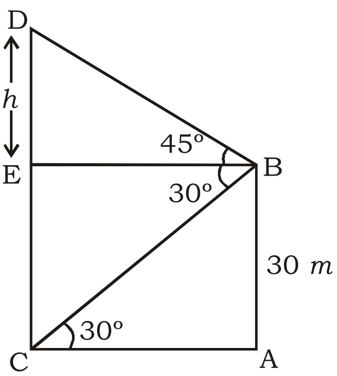
$$= \lim_{x\to\infty}\left(1+\frac{3}{x+2}\right)^{\frac{x+2}{3}\times\frac{(x+3)\times 3}{x+2}}$$

$$= \lim_{x\to\infty}\left[\left(1+\frac{3}{x+2}\right)^{\frac{x+2}{3}}\right]^{\frac{3\left(1+\frac{3}{x}\right)}{\left(1+\frac{2}{x}\right)}}$$

$$= e^{3\lim_{x\to\infty}\frac{\left(1+\frac{3}{x}\right)}{\left(1+\frac{2}{x}\right)}}$$

$= e^3$

59. (D)



Let DE = h m

In ΔBED

$$\tan 45° = \frac{\text{DE}}{\text{BE}} = \frac{h}{\text{BE}}$$

$$1 = \frac{h}{\text{BE}}$$

BE = h

In ΔABC

$$\tan 30° = \frac{AB}{AC} = \frac{AB}{BE}$$

$$\frac{1}{\sqrt{3}} = \frac{30}{h}$$

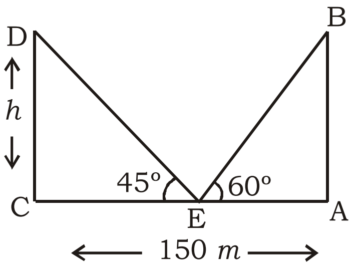
$h = 30\sqrt{3}$

height of the tower = CD = CE + DE

$= 30 + 30\sqrt{3}$

$= 30(\sqrt{3} + 1)$ m

60. (C)



Let height of pole = h m = CD = AB

In ΔDCE

$$\tan 45° = \frac{CD}{CE} = \frac{h}{CE}$$

$CE = h$

then AE = $(150 - h)$ m

In ΔABE

$$\tan 60° = \frac{AB}{AE}$$

$$\sqrt{3} = \frac{h}{150-h}$$

$150\sqrt{3} - h\sqrt{3} = h$

$150\sqrt{3} = h(\sqrt{3}+1)$

$$h = \frac{150\sqrt{3}}{\sqrt{3}+1} = 75(3-\sqrt{3})$$

61. (C) $\cos^{-1}x + \tan^{-1}\left(\frac{1}{3}\right) = \frac{\pi}{2}$

$$\cos^{-1}x = \frac{\pi}{2} - \tan^{-1}\left(\frac{1}{3}\right)$$

$$\cos^{-1}x = \cot^{-1}\left(\frac{1}{3}\right)$$

$\cos^{-1}x = \tan^{-1}(3)$

$\cos^{-1} x = \cos^{-1} \dfrac{1}{\sqrt{10}}$

$\left[\because \tan^{-1} x = \cos^{-1} \dfrac{1}{\sqrt{1+x^2}}\right]$

$x = \dfrac{1}{\sqrt{10}}$

62. (B) $\tan\left[\dfrac{\pi}{4} - \dfrac{1}{2}\cos^{-1}\dfrac{x}{y}\right] + \tan\left[\dfrac{\pi}{4} + \dfrac{1}{2}\cos^{-1}\dfrac{x}{y}\right]$

Let $\dfrac{1}{2}\cos^{-1}\dfrac{x}{y} = \theta$

$\dfrac{x}{y} = \cos 2\theta$

$\Rightarrow \tan\left[\dfrac{\pi}{4} - \theta\right] + \tan\left[\dfrac{\pi}{4} - \theta\right]$

$\Rightarrow \dfrac{1-\tan\theta}{1+\tan\theta} + \dfrac{1+\tan\theta}{1-\tan\theta}$

$\Rightarrow \dfrac{1+\tan^2\theta - 2\tan\theta + 1 + \tan^2\theta + 2\tan\theta}{1-\tan^2\theta}$

$\Rightarrow \dfrac{2\sec^2\theta}{\dfrac{\cos^2\theta - \sin^2\theta}{\cos^2\theta}}$

$\Rightarrow \dfrac{2}{\cos 2\theta}$

$\Rightarrow \dfrac{2y}{x}$

63. (C) Given that A = {3, 4, 5, 6} and B = {4, 5}

(A×B) = {(3, 4), (3, 5), (4, 4), (4, 5), (5, 4), (5, 5), (6, 4), (6, 5)}

(B× A) = {(4, 3), (4, 4) (4, 5), (4, 6), (5, 3), (5, 4), (5, 5), (5, 6)}

$(A \times B) \cap (B \times A)$ = {(4, 4), (4, 5), (5, 4), (5, 5)}

64. (D) $\dfrac{x\omega^9 + y\omega^{13} + z\omega^{17}}{y + z\omega^7 + x\omega^5}$

$\Rightarrow \dfrac{x + y\omega + z\omega^2}{y + z\omega + x\omega^2}$

$\Rightarrow \dfrac{\omega(x + y\omega + z\omega^2)}{\omega(y + z\omega + x\omega^2)}$

$\Rightarrow \dfrac{\omega(x + y\omega + z\omega^2)}{(y\omega + z\omega^2 + x\omega^3)}$

$\Rightarrow \dfrac{\omega(x + y\omega + z\omega^2)}{(x + y\omega + z\omega^2)}$

$\Rightarrow \omega$

65. (A) $0.4\overline{35} = \dfrac{435-4}{990} = \dfrac{431}{990}$

66. (B) $A = \begin{bmatrix} x & y & z \\ x^2 & y^2 & z^2 \\ 1+x^2 & 1+y^2 & 1+z^2 \end{bmatrix}$

$|A| = \begin{vmatrix} x & y & z \\ x^2 & y^2 & z^2 \\ 1+x^2 & 1+y^2 & 1+z^2 \end{vmatrix}$

$= \begin{vmatrix} x & y & z \\ x^2 & y^2 & z \\ 1 & 1 & 1 \end{vmatrix} + \begin{vmatrix} x & y & z \\ x^2 & y^2 & z^2 \\ x^2 & y^2 & z^2 \end{vmatrix}$

$= \begin{vmatrix} x & y & z \\ x^2 & y^2 & z^2 \\ 1 & 1 & 1 \end{vmatrix} + 0$ ($\because$ two Rows are identical)

$C_2 \to C_2 - C_1,\ C_3 \to C_3 - C_1$

$= \begin{vmatrix} x & y-x & z-x \\ x^2 & y^2-x^2 & z^2-x^2 \\ 1 & 0 & 0 \end{vmatrix}$

$= (y-x)(z-x) \begin{vmatrix} x & 1 & 1 \\ x^2 & y+x & z+x \\ 1 & 0 & 0 \end{vmatrix}$

$C_3 \to C_3 - C_2$

$= (y-x)(z-x) \begin{vmatrix} x & 1 & 0 \\ x^2 & y+x & z-y \\ 1 & 0 & 0 \end{vmatrix}$

$= (y-x)(z-x)\ [x \times 0 - 1(-(z-y)+0)$

$= (y-x)(z-x)(z-y)$

$= (x-y)(y-z)(z-x)$

67. (C) cos 36° cos 72° cos 108° cos 144°

$\Rightarrow$ cos 36°. cos 72° cos(180 – 72)° cos(180 – 36)°

$\Rightarrow$ cos 36°.cos72° (– cos 72)° (– cos 36)°

$\Rightarrow \cos 36^\circ.\cos^2 72^\circ$

$\Rightarrow (\cos 36)^2 . (\sin 18)^2$

$$\Rightarrow \left(\frac{\sqrt{5}+1}{4}\right)^2 \left(\frac{\sqrt{5}-1}{4}\right)^2$$

$$\Rightarrow \left[\frac{(\sqrt{5}+1)(\sqrt{5}-1)}{16}\right]^2$$

$$\Rightarrow \left[\frac{4}{16}\right]^2$$

$$\Rightarrow \frac{1}{16}$$

68. (B) $\tan 9^\circ - \tan 27^\circ - \tan 63^\circ + \tan 81^\circ$

$\Rightarrow \cot 81^\circ - \cot 63^\circ - \tan 63^\circ + \tan 81^\circ$

$\Rightarrow (\tan 81^\circ + \cot 81^\circ) - (\tan 63^\circ + \cot 63^\circ)$

$$= \frac{\sin^2 81^\circ + \cos^2 81^\circ}{\sin 81^\circ.\cos 81^\circ} - \frac{\sin^2 63^\circ + \cos^2 63^\circ}{\sin 63^\circ.\cos 63^\circ}$$

$$= \frac{2\times 1}{2\sin 81^\circ.\cos 81^\circ} - \frac{2\times 1}{2\sin 63^\circ.\cos 63^\circ}$$

$$= \frac{2}{\sin 162^\circ} - \frac{2}{\sin 126^\circ}$$

$$= \frac{2}{\sin 18^\circ} - \frac{2}{\cos 36^\circ}$$

$$= \frac{2}{\frac{\sqrt{5}-1}{4}} - \frac{2}{\frac{\sqrt{5}+1}{4}}$$

$$= \frac{8}{\sqrt{5}-1} - \frac{8}{\sqrt{5}+1}$$

$$= 8\left[\frac{2}{4}\right]$$

$= 4$

69. (C) $\lim_{x\to\infty} x^{\frac{3}{2}} \left(\sqrt{x^3+1} - \sqrt{x^3-1}\right)$

$$\Rightarrow \lim_{x\to\infty} \frac{x^{\frac{3}{2}}\left(\sqrt{x^3+1}-\sqrt{x^3-1}\right)}{\left(\sqrt{x^3+1}+\sqrt{x^3-1}\right)} \times \left(\sqrt{x^3+1}+\sqrt{x^3-1}\right)$$

$$\Rightarrow \lim_{x\to\infty} \frac{x^{\frac{3}{2}}\left(x^3+1-x^3+1\right)}{\sqrt{x^3+1}+\sqrt{x^3-1}}$$

$$\Rightarrow \lim_{x\to\infty} \frac{2x^{\frac{3}{2}}}{x^{\frac{3}{2}}\left(\sqrt{1+\frac{1}{x^3}}+\sqrt{1-\frac{1}{x^3}}\right)}$$

$$= \frac{2}{\sqrt{1+0}+\sqrt{1-0}}$$

$$= \frac{2}{2} = 1$$

70. (B) $y = a \sin(\log x) - b\cos(\log x)$ ...(i)

On differentiating both side w.r.t 'x'

$$\frac{dy}{dx} = a\cos(\log x) \times \frac{1}{x} + b\sin(\log x) \times \frac{1}{x}$$

$$x\frac{dy}{dx} = a\cos(\log x) + b\sin(\log x) \quad ...(ii)$$

again, differentiating both side w.r.t. 'x'

$$x.\frac{d^2y}{dx^2} + \frac{dy}{dx}.1 = -a\sin(\log x)\times\frac{1}{x} + b\cos(\log x)\times\frac{1}{x}$$

$$x^2\frac{d^2y}{dx^2} + x\frac{dy}{dx} = -[a\sin(\log x) - b\cos(\log x)]$$

$$x^2\frac{d^2y}{dx^2} + x\frac{dy}{dx} = -y$$

$$x^2\frac{d^2y}{dx^2} + x\frac{dy}{dx} + y = 0$$

71. (C) $y = \frac{\log x}{x}$

on differentiating both side *w.r.t* 'x'

$$\frac{dy}{dx} = \frac{x.\frac{1}{x} - \log x.1}{x^2}$$

$$\frac{dy}{dx} = \frac{1-\log x}{x^2}$$

again, differentiating both side w.r.t. 'x'

$$\frac{d^2y}{dx^2} = \frac{x^2\left(0-\frac{1}{x}\right) - (1-\log x)\times 2x}{(x^2)^2}$$

$$\frac{d^2y}{dx^2} = \frac{x(2\log x - 3)}{x^4}$$

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

72. (D) $f(x) = \begin{cases} \dfrac{\sin x + x\cos x}{x}, & \text{if } x \neq 0 \\ k, & \text{if } x \neq 0 \end{cases}$

is continuous at $x = 0$

then

L.H.L = R.H.L. = $f(0)$

L.H.L = $\lim_{x\to 0^-} f(x) = f(0)$

$$\lim_{x\to 0} \frac{\sin x + x\cos x}{x} = k$$

by L-Hospital's Rule

$$\lim_{x\to 0} \frac{\cos x + x.(-\sin x) + \cos x.1}{1} = k$$

$\cos 0 + 0 + \cos 0 = k$

$k = 2$

73. (A) $I = \int \frac{x^2+1}{(x^2+4)(x^2+25)} dx$

$$I = \int \left[\frac{8}{7}\frac{1}{x^2+25} - \frac{1}{7}\frac{1}{x^2+4}\right] dx$$

$$I = \left[\frac{8}{7} \times \frac{1}{5}\tan^{-1}\frac{x}{5} - \frac{1}{7} \times \frac{1}{2}\tan^{-1}\frac{x}{2}\right] + c$$

$$I = \frac{8}{35}\tan^{-1}\frac{x}{5} - \frac{1}{14}\tan^{-1}\frac{x}{2} + c$$

74. (C) $I = \int \left\{\frac{1}{\log x} - \frac{1}{(\log x)^2}\right\} dx$

Let $\log x = t \Rightarrow x = e^t$

$$\frac{1}{x}dx = dt$$

$dx = x\,dt$

$dx = e^t\,dt$

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

$$I = e^t . \frac{1}{t} + c$$

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

$$I = \frac{x}{\log x} + c$$

75. (C) $I = \int_2^3 \frac{\sqrt{5-x}}{\sqrt{x} + \sqrt{5-x}} dx$ ...(i)

$I = \int_2^3 \frac{\sqrt{x}}{\sqrt{5-x} + \sqrt{x}} dx$ ...(ii)

$$\left[\because \int_a^b f(x)dx = \int_a^b f(a+b-x)dx\right]$$

On adding equation (i) and equation (ii)

$$2I = \int_2^3 1.dx$$

$$2I = [x]_2^3$$

$2I = 3 - 2$

$$I = \frac{1}{2}$$

76. (D) $I = \int_{0.2}^{3.5} [x]\,dx$ where [.] is greatest integer.

$$I = \int_{0.2}^{1}[x]\,dx + \int_1^2 [x]\,dx + \int_2^3 [x]\,dx + \int_3^{3.5}[x]\,dx$$

$$I = \int_{0.2}^{1} 0.dx + \int_1^2 1.dx + \int_2^3 2dx + \int_3^{3.5} 3dx$$

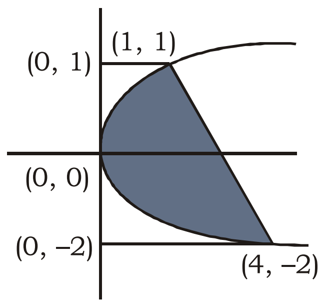
$$I = 0 + (x)_1^2 + 2(x)_2^3 + 3(x)_3^{3.5}$$

$I = (2 - 1) + 2(3 - 2) + 3(3.5 - 3)$

$$= 1 + 2 + 3 \times \frac{1}{2}$$

$I = 4 .5$

77. (B)



Parabola $y^2 = x$

$x_1 \Rightarrow x = y^2$ ...(i)

and line $x_2 \Rightarrow x = 2 - y$ ...(ii)

On solving equation (i) and equation (ii)

$x = 1, x = 4$

$y = 1, x = -2$

Area = $\left|\int_{-2}^{1}(x_1 - x_2)dx\right|$

$= \left|\int_{-2}^{1}(y^2 - 2 + y)\,dx\right|$

$= \left|\left[\frac{y^3}{3} - 2y + \frac{y^2}{2}\right]_{-2}^{1}\right|$

$= \left|\left(\frac{1}{3} - 2 + \frac{1}{2}\right) - \left(-\frac{8}{3} + 4 + 2\right)\right|$

$= \left|\frac{-7}{6} - \left(\frac{10}{3}\right)\right|$

$= \left|\frac{-27}{6}\right|$

$= \frac{9}{2}$

78. (B) $f(x) = \frac{1}{\sqrt{x + |x|}}$

$x + |x| > 0$

$|x| > -x$

$x > 0$

Domain of the function = R^+

79. (D) Given $f(x) = \frac{5x+3}{4x-5}$

$f[f(x)] = f\left[\frac{5x+3}{4x-5}\right]$

$= \frac{5\left(\frac{5x+3}{4x-5}\right)+3}{4\left(\frac{5x+3}{4x-5}\right)-5}$

$= \frac{25x+15+12x-15}{20x+12-20x+25}$

$= \frac{37x}{37}$

$f[f(x)] = x$

80. (A) $R_1 = \{(1, a), (1, b), (1, c)\}$

$R_2 = \{(1, c), (2, b), (2, a)\}$

81. (D) Given that

$5f(x) + 3f\left(\frac{1}{x}\right) = \frac{1}{x} + 7$ ...(i)

on putting $x = \frac{1}{x}$

$5f\left(\frac{1}{x}\right) + 3f(x) = x + 7$ ...(ii)

On solving equation (i) and equation (ii)

$25f(x) - 9f(x) = \frac{5}{x} + 35 - 3x - 21$

$16f(x) = \frac{5}{x} - 3x + 14$

On putting $x = 1$

$16f(1) = 5 - 3 + 14$

$16f(1) = 16$

$f(1) = 1$

82. (B) $\begin{vmatrix} y & x & y+z \\ z & y & x+y \\ x & z & z+x \end{vmatrix}$

$R_1 \to R_1 + R_2 + R_3$

$= \begin{vmatrix} x+y+z & x+y+z & 2(x+y+z) \\ z & y & x+y \\ x & z & z+x \end{vmatrix}$

$= (x+y+z)\begin{vmatrix} 1 & 1 & 2 \\ z & y & x+y \\ x & z & z+x \end{vmatrix}$

$C_1 \to C_1 - C_2,\ C_3 \to C_3 - 2C_2$

$= (x+y+z)\begin{vmatrix} 0 & 1 & 0 \\ z-y & y & x-y \\ x-z & z & x-z \end{vmatrix}$

$= (x+y+z)\,[0 - 1\,\{(z-y)(x-z) - (x-z)(x-y)\} + 6]$

$= -(x+y+z)\,[xz - z^2 - xy + yz - x^2 + xy + xz - yz]$

$= (x+y+z)(x^2 + z^2 - 2xz)$

$= (x+y+z)(x-z)^2$

83. (B) $\tan\left(7\frac{1}{2}\right)^\circ = \frac{2\sin^2\left(7\frac{1}{2}\right)^\circ}{2\sin\left(7\frac{1}{2}\right)^\circ \cos\left(7\frac{1}{2}\right)^\circ}$

$= \frac{1-\cos 15^\circ}{\sin 15^\circ}$

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

$= \dfrac{2\sqrt{2}-\sqrt{3}-1}{\sqrt{3}-1} \times \dfrac{\sqrt{3}+1}{\sqrt{3}+1}$

$= \dfrac{2\sqrt{6}-3-\sqrt{3}+2\sqrt{2}-\sqrt{3}-1}{2}$

$= \dfrac{2\sqrt{6}-2\sqrt{3}+2\sqrt{2}-4}{2}$

$= \sqrt{6} - \sqrt{3} + \sqrt{2} - 2$

84. (B) $f(x) = \sin^{-1}\left(\log_3 \dfrac{x}{4}\right)$

We know that domain of $\sin^{-1} x = x \in [-1, 1]$

$-1 \le \log_3 \dfrac{x}{4} \le 1$

$3^{-1} \le \dfrac{x}{4} \le 3^1$

$\dfrac{1}{3} \le \dfrac{x}{4} \le 3$

$\dfrac{4}{3} \le x \le 12$

domain of the function $\Rightarrow x \in \left[\dfrac{4}{3}, 12\right]$

85. (C) $f(x) = \begin{cases} \dfrac{e^{\frac{1}{x}}+1}{e^{\frac{1}{x}}-1}, & \text{when } x \ne 0 \\ 0, & \text{when } x = 0 \end{cases}$

L. H. L. $= \lim\limits_{x\to 0^-} f(x) = \lim\limits_{h\to 0} f(0-h)$

$= \lim\limits_{h\to 0} \dfrac{e^{\frac{1}{-h}}+1}{e^{\frac{1}{-h}}-1}$

$= \dfrac{e^{-\infty}+1}{e^{-\infty}-1}$

$= \dfrac{0+1}{0-1} = -1$

R.H.L. $= \lim\limits_{x\to 0^+} f(x) = \lim\limits_{h\to 0} f(0+h)$

$= \lim\limits_{h\to 0} \dfrac{e^{\frac{1}{h}}+1}{e^{\frac{1}{h}}-1}$

$= \lim\limits_{h\to 0} \dfrac{1+\dfrac{1}{e^{\frac{1}{h}}}}{1-e^{\frac{1}{h}}}$

$= \dfrac{1+0}{1-0} = 1$

L.H.L. $\ne$ R.H.L.

So $f(x)$ is discontinuous at $x = 0$

86. (C) $f(x) = \begin{cases} px^2 - 3, \text{if } x \le 2 \\ -\dfrac{3}{2}x + 4p, \text{if } x > 2 \end{cases}$

L.H.D. $= \lim\limits_{h\to 0} \dfrac{f(2-h)-f(2)}{-h}$

$= \lim\limits_{h\to 0} \dfrac{\left(p(2-h)^2-3\right)-(4p-3)}{-h}$

$= \lim\limits_{h\to 0} \dfrac{h(hp-4p)}{h}$

$= 0 - 4p = -4p$

R.H.D. $= \lim\limits_{h\to 0} \dfrac{f(2+h)-f(z)}{h}$

$= \lim\limits_{h\to 0} \dfrac{-\dfrac{3}{2}(2+h)+4p-(4p-3)}{h}$

$= -\dfrac{3}{2}$

$f(x)$ is derivable at $x = 2$

So L.H.D. = R.H.D.

$-ap = -\dfrac{3}{2}$

$p = \dfrac{3}{8}$

87. (B) curve $x^2 + y^2 - 2x - 9y + 20 = 0$

equation of tangent at (x_1, y_1)

$xx_1 + yy_1 - (x + x_1) - \dfrac{9}{2}(y + y_1) + 20 = 0$

here $(x_1, y_1) = (2, 4)$

$2x + 4y - (x + 2) - \dfrac{9}{2}(y + 4) + 20 = 0$

$2x + 4y - x - 2 - \dfrac{9}{2}y - 18 + 20 = 0$

$x - \frac{y}{2} = 0$

$x = \frac{y}{2}$

$2x = y$

$2x - y = 0$

88. (A) $f(x) = 2x^3 - 3x^2 - 12x + 4$

on differentiating both side w.r.t. 'x'

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

again, differentiating both side w.r.t.'x'

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

for maxima and minima

$f'(x) = 0$

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

$x^2 - x - 2 = 0$

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

$x = -1, 2$

On putting $x = -1$ in equation (ii)

$f''(-1) = -12 - 6 = -18$ (maxima)

on putting $x = 2$ in equation (ii)

$f''(2) = 12 \times 2 - 6 = 18$ (minima)

Hence $f(x)$ is maximum at $x = -1$

89. (B) Given that $|\vec{a}| = 20$, $|\vec{b}| = 2$

$\vec{a}.\vec{b} = 24$

$\vec{a}.\vec{b} = |\vec{a}||\vec{b}| \cos\theta$

$24 = 20 \times 2 \cos\theta$

$\cos\theta = \frac{3}{5}$

$|\vec{a} \times \vec{b}| = ||\vec{a}||\vec{b}| \sin\theta\, \hat{n}|$

$= 20 \times 2 \times \frac{4}{5} \times 1$

$= 32$

90. (B)

91. (B) $\left(\frac{1-i}{1+i}\right)^3 - \left(\frac{1+i}{1-i}\right)^3 = x + iy$

$\Rightarrow \frac{[(1-i)^2]^3 - [(1+i)^2]^3}{[(1+i)(1-i)]^3} = x + iy$

$\Rightarrow \frac{(-2i)^3 - (2i)^3}{2^3} = x + iy$

$\Rightarrow \frac{8i + 8i}{8} = x + iy$

$\Rightarrow \frac{16i}{8} = x + iy$

$\Rightarrow 2i = x + iy$

$x = 0, y = 2$

then $x - y = -2$

92. (A) $i^{15} + 3i^{17} + 3i^{35} - 4i^{39} - 6i^{44}$

$= i^3 + 3i + 3i^3 - 4i^3 - 6$

$= -i + 3i - 3i + 4i - 6$

$= 3i - 6$

93. (B) time is 8 : 35

formula

angle (θ) = $\left|\frac{11M - 60H}{2}\right|$ Where M = Minute

H = hour

$= \left|\frac{11 \times 35 - 60 \times 8}{2}\right|$

$= \left|\frac{385 - 480}{2}\right|$

$= \frac{95}{2} = \left(47\frac{1}{2}\right)^\circ$

94. (D) Sine Rule

$\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C} = k$

$a = k \sin A$, $b = k \sin B$, $c = k \sin C$

$\frac{b^2 - c^2}{a^2} = \frac{k^2 \sin^2 B - k^2 \sin^2 C}{k^2 \sin^2 A}$

$= \frac{\sin^2 B - \sin^2 C}{\sin^2 A}$

$= \frac{\sin(B+C)\sin(B-C)}{\sin^2(\pi - (B+C))}$

$= \frac{\sin(B+C)\sin(B-C)}{\sin^2(B+C)}$

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

95. (C) We know that $\cos A = \frac{b^2 + c^2 - a^2}{2bc}$

$\cos B = \frac{c^2 + a^2 - b^2}{2ca}$, $\cos C = \frac{a^2 + b^2 - c^2}{2ab}$

then

$\frac{\cos A}{a} + \frac{\cos B}{b} + \frac{\cos C}{c}$

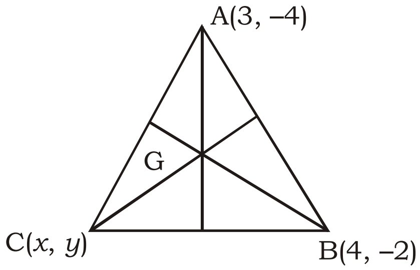
$= \frac{b^2 + c^2 - a^2}{2abc} + \frac{c^2 + a^2 - b^2}{2abc} + \frac{a^2 + b^2 - c^2}{2abc}$

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

96. (B) tan 10°tan30°tan50° tan 70°
$\Rightarrow$ tan 30° (tan 10° tan 50° tan 70°)
$\Rightarrow$ tan30°× tan 30°
[$\because$ tan θtan (60 – θ) tan (60 + θ) = tan 3θ]

$\Rightarrow \frac{1}{\sqrt{3}} \times \frac{1}{\sqrt{3}} = \frac{1}{3}$

97. (A)



Let third vertex of the triangle = (x, y)
given $G(3, -2)$
Co-ordinate of centroid

$3 = \frac{x + 3 + 4}{3}$ and $-2 = \frac{y - 4 - 2}{3}$

$9 = x + 7$ $\quad -6 = y - 6$
$x = 2$ and $y = 0$
third vertex $C(x, y) = (2, 0)$

98. (C) Points (1, 2), (5, – 3) and (3, – λ)
these points lie on the straight line, then

$$\begin{vmatrix} 1 & 2 & 1 \\ 5 & -3 & 1 \\ 3 & -\lambda & 1 \end{vmatrix} = 0$$

$1(-3 + \lambda) - 2(5 - 3) + 1(-5\lambda + 9) = 0$

$\lambda = \frac{1}{2}$

99.(B) In point (x, y), x can positive or negative but distance never negative.
So perpendicular distance from the y-axis $= |x|$

100. (C) Parabola
$(y + 2)^2 = 16(x - 3)$
$Y^2 = 16X$ where $X = x - 3$
$4a = 16$ $\quad Y = y + 2$
$a = 4$
parameter $X = at^2$ and $Y = 2at$
$x - 3 = 4t^2$ $\quad y + 2 = 2 \times 4 \times t$
$x = 4t^2 + 3$ $\quad y = 8t - 2$
parameter $(4t^2 + 3, 8t - 2)$

101. (B) ellipse $\frac{x^2}{4} + \frac{y^2}{9} = 1$ ...(i)
and circle $x^2 + y^2 = 4$
$x^2 = 4 - y^2$ ...(ii)
On solving equation (i) and (ii)
$y = 0, x = \pm 2$
point (2, 0) and (– 2, 0)
Thus ellipse and circle intersect at two points.

102. (C) Given that $\frac{x^2}{16} + \frac{y^2}{9} = 1$
We know that
The locus of the point of intersection of two perpendicular tangents drawn on the ellipse is $x^2 + y^2 = a^2 + b^2$.
then $x^2 + y^2 = 16 + 9$
$x^2 + y^2 = 25$
Which is director circle.

103. (C) 3, 9, 27, 81
G.M. $= (3 \times 9 \times 27 \times 81)^{1/4}$
$= (3^1 \times 3^2 \times 3^3 \times 3^4)^{1/4}$
$= (3^{10})^{1/4}$
$= 3^{5/2}$
$= \sqrt{243} = 9\sqrt{3}$

104. (B) Given that
$\Sigma x_i = 12, \Sigma y_i = 36, \Sigma x_i y_i = 112$ and $n = 5$
We know that

$\text{cov}(x, y) = \frac{\sum x_i y_i}{n} - \frac{\sum x_i \sum y_i}{n^2}$

$= \frac{112}{5} - \frac{12 \times 36}{25}$

$= \frac{560 - 432}{25}$

$= \frac{128}{25} = 5.12$

105. (B) The value of sin θ lies between –1 and 1.
The value of 'cos θ' lies between – 1 and 1.

106. (B) $2\sin^2 x = 1$

$\sin^2 x = \frac{1}{2}$

$$\sin^2 x = \sin^2 \frac{\pi}{4}$$

then $x = n\pi \pm \frac{\pi}{4}$

107. (A) $5\theta = 90$

$2\theta + 3\theta = 90$

$2\theta = (90 - 3\theta)$

$\cos 2\theta = \cos(90 - 3\theta)$

$1 - 2\sin^2\theta = \sin 3\theta$

$1 - 2\sin^2\theta = 3\sin\theta - 4\sin^3\theta$

$4\sin^3\theta - 2\sin^2\theta - 3\sin\theta + 1 = 0$

$(\sin\theta - 1)(4\sin^2\theta + 2\sin\theta - 1) = 0$

$\sin\theta - 1 \neq 0$

because $\theta \neq 90$

$4\sin^2\theta + 2\sin\theta - 1 = 0$

$$\sin\theta = \frac{-2 \pm \sqrt{(2)^2 - 4\times 4\times(-1)}}{2\times 4}$$

$$\sin\theta = \frac{-2 \pm \sqrt{20}}{8}$$

$$\sin\theta = \frac{-2 \pm 2\sqrt{5}}{8}$$

$$\sin\theta = \frac{-1 \pm \sqrt{5}}{4}$$

here $\theta = 18°$

$$\sin 18 = \frac{\sqrt{5} - 1}{4}$$

because $\sin x \geq 0$ between $\left[0, \frac{\pi}{2}\right]$

108. (A) $\int_0^2 x^m (2-x)^n\, dx = k\int_0^2 x^n (2-x)^m\, dx$

Property $\int_0^a f(x)\, dx = \int_0^a f(a-x)\, dx$

$$\int_0^2 (2-x)^m x^n\, dx = k\int_0^2 x^n (2-x)^m\, dx$$

$k = 1$

109. (A) Given that

$$\int_{-1}^2 f(x)\, dx = \frac{7}{5} \text{ and } \int_{-1}^4 f(x)\, dx = \frac{4}{3}$$

$$\int_{-1}^2 f(x)\, dx + \int_2^4 f(x)\, dx = \int_{-1}^4 f(x)\, dx$$

$$\frac{7}{5} + \int_2^4 f(x)\, dx = \frac{4}{3}$$

$$\int_2^4 f(x)\, dx = \frac{4}{3} - \frac{7}{5}$$

$$= \frac{-1}{15}$$

(110-112) :

110. (B) $I = \int \frac{1}{(x + x^6)}\, dx$

$$I = \int \frac{1}{x(x + x^5)}\, dx$$

$$I = \int \frac{x^4}{x^5(1 + x^5)}\, dx$$

Let $x^5 = t$

$5x^4\, dx = dt$

$x^4 dx = \frac{1}{5} dt$

$$I = \frac{1}{5}\int \frac{1}{t(1+t)}\, dt$$

$$I = \frac{1}{5}\int \left[\frac{1}{t} - \frac{1}{1+t}\right] dx$$

$$I = \frac{1}{5}[\log t - \log(1+t)] + c$$

$$I = \frac{1}{5}\left[\log \frac{t}{1+t}\right] + c$$

$$I = \frac{1}{5}\log\left[\frac{x^5}{1+x^5}\right] + c$$

$$f(x) = \frac{1}{5}\log\left[\frac{x^5}{1+x^5}\right]$$

111. (B) $I = \int \frac{x^5}{x + x^6}\, dx = \int \frac{x^5 + 1 - 1}{(1 + x^5)}\, dx$

$$I = \int \left(\frac{1}{x} - \frac{1}{x + x^6}\right) dx$$

$= \log x - f(x) + c$

112. (B) $\int \frac{\sin x}{\cos x + \cos^6 x}\, dx$

Let $\cos x = t$

$-\sin x\, dx = dt$

$\sin x\, dx = -dt$

$\Rightarrow \int \frac{-dt}{t+t^6}$

$\Rightarrow -\int \frac{1}{t+t^6}\ dt$

$\Rightarrow -f(t) + c$

$\Rightarrow -f(\cos x) + c$

113. (C) Let $y = \sqrt{10+3\sqrt{10+3\sqrt{10+\ldots\infty}}}$

$y = \sqrt{10+3y}$

$y^2 = 10 + 3y$

$y^2 - 3y - 10 = 0$

$(y-5)(y+2) = 0$

$y = 5, -2$

then the value of expression = 5

(114-116) :

114. (B) equation

$3x^2 + 5x + 4 = 0$

sum of the roots $\alpha + \beta = \frac{-5}{3}$

product of the root $\alpha.\beta = \frac{4}{3}$

115. (C) $\alpha^2 + \beta^2 = (\alpha+\beta)^2 - 2\alpha\beta$

$= \left(\frac{-5}{3}\right)^2 - 2 \times \frac{4}{3}$

$= \frac{25}{9} - \frac{8}{3}$

$= \frac{1}{9}$

116. (A) sum of the roots $= \frac{1}{\alpha} + \frac{1}{\beta}$

$= \frac{\alpha+\beta}{\alpha\beta}$

$= \frac{\frac{-5}{3}}{\frac{4}{3}}$

$= -\frac{5}{4}$

product of the roots $= \frac{1}{\alpha} \times \frac{1}{\beta}$

$= \frac{\frac{1}{4}}{3}$

$= \frac{3}{4}$

equation

x^2 – (sum of the roots) x + Product of the Roots = 0

$x^2 + \frac{5}{4}x + \frac{3}{4} = 0$

$4x^2 + 5x + 3 = 0$

117. (A) $\tan^{-1}\frac{x}{y} + \tan^{-1}\left(\frac{x+y}{x-y}\right)$

$\Rightarrow \tan^{-1}\left[\frac{\frac{x}{y}+\frac{x+y}{x-y}}{1-\frac{x}{y}\times\frac{x+y}{x-y}}\right]$

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

$\Rightarrow \tan^{-1}(-1)$

$\Rightarrow \tan^{-1}\left[\tan\left(-\frac{\pi}{4}\right)\right]$

$\Rightarrow -\frac{\pi}{4}$

118. (A) $2\tan^{-1}\left(\frac{1}{3}\right) + \tan^{-1}\left(\frac{1}{7}\right)$

$\Rightarrow \tan^{-1}\left(\frac{\frac{2}{3}}{1-\frac{1}{9}}\right) + \tan^{-1}\left(\frac{1}{7}\right)$

$\Rightarrow \tan^{-1}\frac{3}{4} + \tan^{-1}\left(\frac{1}{7}\right)$

$\Rightarrow \tan^{-1}\left[\frac{\frac{3}{4}+\frac{1}{7}}{1-\frac{3}{4}\times\frac{1}{7}}\right]$

$\Rightarrow \tan^{-1}\left[\frac{\frac{25}{28}}{\frac{25}{28}}\right]$

$\Rightarrow \tan^{-1}(1)$

$\Rightarrow \frac{\pi}{4}$

Assertion (A) is true.

Reason (R) is also true and R is cor explanation of A.

119. (B)

```
 1 0 0 0 1
 1 1 0 0 1
   1 1 0 1
     1 1 0
       1 0
 111111
```

120. (B) $\frac{\sin 15^\circ - \sin 45^\circ}{\sin^3 15 - \sin^3 45^\circ}$

$\Rightarrow \frac{\sin 15^\circ - \sin 45^\circ}{(\sin 15^\circ - \sin 45^\circ)(\sin^2 15 + \sin^2 45 + \sin 15^\circ . \sin 4}$

$\Rightarrow \frac{1}{\sin^2 15^\circ + \sin^2 45^\circ + \sin 15^\circ . \sin 45^\circ}$

$\Rightarrow \frac{1}{\left(\frac{\sqrt{3}-1}{2\sqrt{2}}\right)^2 + \left(\frac{1}{\sqrt{2}}\right)^2 + \frac{\sqrt{3}-1}{2\sqrt{2}} \times \frac{1}{\sqrt{2}}}$

$\Rightarrow \frac{1}{\frac{4-2\sqrt{3}}{8} + \frac{1}{2} + \frac{\sqrt{3}-1}{4}}$

$\Rightarrow \frac{8}{4 - 2\sqrt{3} + 4 + 2\sqrt{3} - 2}$

$\Rightarrow \frac{8}{6} = \frac{4}{3}$

NDA (MATHS) MOCK TEST - 76 (Answer Key)

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

Note : *If your opinion differ regarding any answer, please message the mock test and Question number to 8860330003*

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

Note : *Whatsapp with Mock Test No. and Question No. at 705360571 for any of the doubts. Join the group and you may also share your sugesstions and experience of Sunday Mock Test.*