All India Aakash Test Series for JEE (Advanced)-2024

TEST - 2A (Paper-1) - Code-C

Test Date : 05/11/2023

ANSWERS

CHEMISTRY		MATHEMATICS		PHYSICS	
1.	(A, B, C)	19.	(C, D)	37.	(A, C)
2.	(A, C, D)	20.	(A, B, C, D)	38.	(A, C, D)
3.	(A, C, D)	21.	(B, C)	39.	(B, D)
4.	(C, D)	22.	(B, C)	40.	(A, C, D)
5.	(A, B)	23.	(A, B, D)	41.	(A, D)
6.	(A, D)	24.	(A, C)	42.	(B, C, D)
7.	(02)	25.	(06)	43.	(00)
8.	(02)	26.	(02)	44.	(02)
9.	(03)	27.	(06)	45.	(12)
10.	(02)	28.	(01)	46.	(10)
11.	(03)	29.	(02)	47.	(02)
12.	(03)	30.	(04)	48.	(04)
13.	(03)	31.	(03)	49.	(03)
14.	(00)	32.	(05)	50.	(12)
15.	(C)	33.	(B)	51.	(B)
16.	(A)	34.	(D)	52.	(B)
17.	(B)	35.	(B)	53.	(C)
18.	(B)	36.	(B)	54.	(D)

HINTS & SOLUTIONS

PART - I (CHEMISTRY)

1. Answer (A, B, C)

   Hint : $FeSO_4$ on heating gives SO_2 and SO_3

   Sol. : $2FeSO_4 \xrightarrow{\Delta} Fe_2O_3 + SO_2 + SO_3$

2. Answer (A, C, D)

   Hint : Al is extracted by electrolytic reduction.

   Sol. : Cu, Hg and Pb can be extracted by self reduction process.

3. Answer (A, C, D)

   Hint : Galena (PbS)

   Sol. : Bauxite – $Al_2O_3 \cdot 2H_2O$

   Haematite – Fe_2O_3

   Calamine – $ZnCO_3$

4. Answer (C, D)

   Hint : Metals which are less reactive than copper may be present as anode mud.

   Sol. : Anode mud in electrorefining of copper contains Ag and Au.

5. Answer (A, B)

   Hint : AgF $\rightarrow$ Soluble in water

   Sol. : AgBr $\rightarrow$ Pale yellow

   AgCl $\rightarrow$ White ppt.

   AgI $\rightarrow$ Bright yellow

6. Answer (A, D)

   Hint : Acidified potassium permanganate can oxidise ferrous and stannous ions.

   Sol. : In Be^{2+} and NO_3^-, central atoms are present in their respective highest oxidation states.

7. Answer (02)

   Hint : Ni is present in +2 oxidation state

   Sol. : Cl^- is a weak field ligand and hence pairing will not take place.

8. Answer (02)

   Hint : Complex is of type $[Ma_3b_3]$

   Sol. : Facial and Meridional isomers are possible for $[Ma_3b_3]$

9. Answer (03)

   Hint : Complex of type $[M(AA)_2a_2]$

   Sol. : Cis isomer is optically active

   Cis forms – two isomers

   Trans form - one isomers

10. Answer (02)

    Hint : Mn^{2+} is pale pink in color

    Sol.: $MnO_4^- + 8H^+ + 5e^- \longrightarrow Mn^{2+} + 4H_2O$

11. Answer (03)

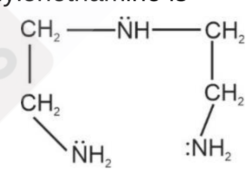
    Hint : Molecular formula of chromite ore is $FeCr_2O_4$

    Sol.: Chromite ore is $FeO \cdot Cr_2O_3$

12. Answer (03)

    Hint : Three nitrogen atoms, each having one lone pair of electrons.

    Sol.: Diethylenetriamine is

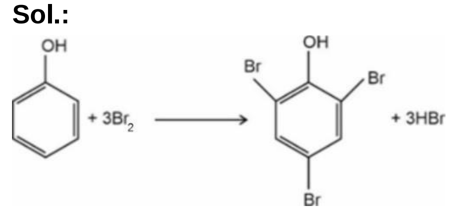


13. Answer (03)

    Hint : White precipitate obtained is

    2, 4, 6-tribromophenol

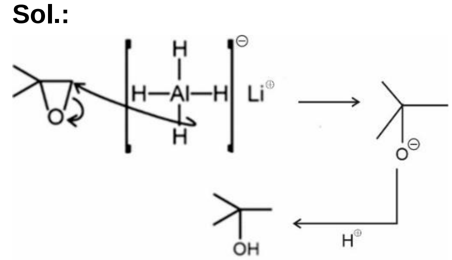
    Sol.:



14. Answer (00)

    Hint : Tertiary butyl alcohol is obtained

    Sol.:



15. Answer (C)

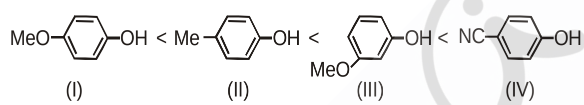
Hint : Acids which are stronger than carbonic acid (H_2CO_3)

Sol. : Only 2, 4, 6-trinitrophenol (Picric acid) will evolve CO_2 gas with aqueous $NaHCO_3$ due to high acidic nature.

16. Answer (A)

Hint : —CN group increases the acidity of phenol.

Sol.: When electronreleasing group like MeO— is present on m-position w.r.t. —OH group then it acts as —I effect group and increases the acidity. MeO— is good electron-releasing group in comparison to –Me. So, order of acidity becomes as follows



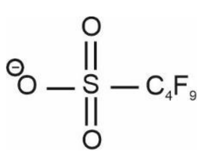
17. Answer (B)

Hint : N_2 is highly inert gas

Sol.: N_2 has the maximum leaving group ability

18. Answer (B)

Hint : Group having maximum leaving ability is least basic.

Sol.:  is having maximum leaving ability.

PART - II (MATHEMATICS)

19. Answer (C, D)

Hint : $\lim_{n\to\infty} \tan\left(\frac{1}{n}\right)\ln\left(\frac{1}{n}\right) = 0 \Rightarrow f(x) = 1$

Sol. : $\lim_{n\to\infty} \tan\left(\frac{1}{n}\right)\ln\left(\frac{1}{n}\right) = 0 \Rightarrow f(x) = 1$

$$\Rightarrow \int \frac{dx}{\sin^{11/3} x \cos^{1/3} x} = \frac{-3}{8}(\tan x)^{-8/3}$$

$$-\frac{3}{2}(\tan x)^{-\frac{2}{3}} + C$$

$$\because g\left(\frac{\pi}{6}\right) = -\frac{21}{8} \times 3^{\frac{1}{3}}$$

$\Rightarrow C = 0$

$$g\left(\frac{\pi}{4}\right) = -\frac{15}{8}$$

20. Answer (A, B, C, D)

Hint :

$$f(x) = \int_{-2}^{x} |t+1|\,dt = -\int_{-2}^{-1}(t+1)\,dt + \int_{-1}^{x}(t+1)dt = \frac{1}{2} + \left(\frac{t^2}{2} + t\right)_{-1}^{x}$$

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

Sol. :

$$f(x) = \int_{-2}^{x} |t+1|\,dt = -\int_{-2}^{-1}(t+1)\,dt + \int_{-1}^{x}(t+1)dt = \frac{1}{2} + \left(\frac{t^2}{2} + t\right)_{-1}^{x}$$

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

$f(x)$ is a quadratic polynomial.

Therefore, $f(x)$ is continuous as well as differentiable in (–1, 1).

Also $f'(x)$ is continuous as well as differentiable in [–1, 1].

21. Answer (B, C)

Hint : : $f(x) = x^3 - x^2 + 100x + 1001$

$f'(x) = 3x^2 - 2x + 100 > 0 \ \forall x \in R$

Sol. : $f(x) = x^3 - x^2 + 100x + 1001$

$f'(x) = 3x^2 - 2x + 100 > 0 \ \forall x \in R$

Therefore, $f(x)$ is increasing (strictly).

Therefore, $f\left(\frac{1}{1999}\right) > f\left(\frac{1}{2000}\right)$

$\Rightarrow f(x + 1) > f(x - 1)$

22. Answer (B, C)

Hint : $f(-x) = -f(x)$

Sol. : $f(x) = ax^3 + bx^2 + cx + d$

Now, $f(x)$ is odd. Therefore,

$f(-x) = -f(x)$

$\Rightarrow -ax^3 - bx^2 - cx - d = ax^3 + bx^2 - cx + d$

It gives $b = 0 = d$

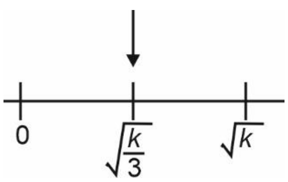
$f(x) = ax^3 + cx = x(ax^2 + c)$

Therefore, $f'(x) = 3ax^2 + c = 0$

Only when $x^2 = -\dfrac{c}{3a}$ is positive

Therefore, c and a are of different signs.

Let $-\dfrac{c}{a} = k$.



So, non-zero root of $f(x)$ is $\pm\sqrt{k}$.

Also $\pm\sqrt{\dfrac{k}{3}}$ is closer to origin than $\pm\sqrt{k}$

23. Answer (A, B, D)

Hint : $F(x) = \displaystyle\int \frac{1}{4-3\cos^2 x + 5\sin^2 x}\,dx$

$$= \int \frac{1}{9-8\cos^2 x}\,dx$$

Sol. : $F(x) = \displaystyle\int \frac{1}{4-3\cos^2 x + 5\sin^2 x}\,dx$

$$= \int \frac{1}{9-8\cos^2 x}\,dx$$

$$= \int \frac{\sec^2 x}{9\sec^2 x - 8}\,dx = \int \frac{\sec^2 x}{1+9\tan^2 x}\,dx$$

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

$\Rightarrow g(x) = 3\tan x$

Therefore, $g\left(\dfrac{\pi}{4}\right) = 3$

And $g'\left(\dfrac{\pi}{3}\right) = 12$

24. Answer (A, C)

Hint : $I_n = \left(\dfrac{e^{-x}(\sin x)^n}{-1}\right)_0^x + n\displaystyle\int_0^x (\sin x)^{n-1}\cos x e^{-x}dx$

$$= \int_0^x \left(-(\sin x)^n + (n-1)(1-\sin^2 x)(\sin x)\right)^{n-2} e^{-x}dx$$

$$= \frac{n(n-1)}{n^2+1} I_{n-2}$$

Sol. : : $I_n = \left(\dfrac{e^{-x}(\sin x)^n}{-1}\right)_0^x + n\displaystyle\int_0^x (\sin x)^{n-1}\cos x e^{-x}dx$

$$= \int_0^x \left(-(\sin x)^n + (n-1)(1-\sin^2 x)(\sin x)\right)^{n-2} e^{-x}dx$$

$$= \frac{n(n-1)}{n^2+1} I_{n-2}$$

Hence, $\dfrac{I_{10}}{I_8} = \dfrac{90}{101}$

25. Answer (06)

Hint : $f(x)$ can have point of inflection at points were $f''(x) = 0$.

Sol. : We have

$f(x) = x^3 - 9x^2 + 200x - 10$

That is, $f'(x) = 3x^2 - 18x + 200 > 0 \;\; \forall x \in R$

$f''(x) = 6x - 18$

for point of inflection, $f''(x) = 0$

$x = 3$

$\Rightarrow x_1 = 3$

$\because f'(x) = 3x^2 - 18x + 200$

$f''(x) = 6x - 18,$

$f'''(x) = 6$

$\Rightarrow x = x_2 = 3$ is point of local minima for $f'(x)$

26. Answer (02)

Hint : $x = -1$ and $x = \dfrac{1}{3}$ are roots of $f'(x) = 0$.

Sol. : $x = -1$ and $x = \dfrac{1}{3}$ are roots of $f'(x) = 0$.

Therefore, $f'(x) = a(3x-1)(x+1)$

$= a(3x^2 + 2x - 1)$

$\Rightarrow f(x) = a(x^3 + x^2 - x + b)$

$f(-2) = 0$

$\Rightarrow b = 2$

$\Rightarrow f(x) = a(x^3 + x^2 - x + 2)$

$$\int_{-1}^{1} f(x)dx = \frac{14}{3}$$

$$\Rightarrow \int_{-1}^{1} a\left(x^3 + x^2 - x + 2\right) = \frac{14}{3}$$

$$\Rightarrow a\int_{-1}^{1} x^2 + 2 = \frac{14}{3}$$

$$\Rightarrow 2a\left(\frac{1}{3} + 2\right) = \frac{14}{3}$$

$\Rightarrow a = 1$

Therefore, $f(x) = x^3 + x^2 - x + 2$

27. Answer (06)

Hint : $g(x) = \frac{d}{dx}\left(f(x)f'(x)\right)$

Sol. : $g(x) = \frac{d}{dx}\left(f(x)f'(x)\right)$

To get the zero of $g(x)$, we take function

$h(x) = f(x)\, f'(x)$

Between any two roots of $h(x)$, there lies at least one root of $h'(x) = 0$. That is,

$g(x) = 0$

Now, $h(x) = 0$ and $f(x) = 0$

Or $f'(x) = 0$

As $f(x) = 0$ has 4 minimum solutions and $f'(x) = 0$ has minimum 3 solutions, $h(x) = 0$ has minimum 7 solutions and $h'(x) = g(x) = 0$ has minimum 6 solutions.

28. Answer (01)

Hint : $f'(x) = e^{-\left(x^2+1\right)^2}, 2x - e^{-\left(x^2\right)^2}.\, 2x$

Sol. : $f'(x) = e^{-\left(x^2+1\right)^2},$

$$e^{-\left(x^2+1\right)^2}, 2x - e^{-\left(x^2\right)^2}.\, 2x = 2xe^{-\left(x^4+2x^2+1\right)}\left(1 - e^{2x^2+1}\right)$$

$\Rightarrow f'(x) > 0,\ \forall x \in (-\infty, 0)$

29. Answer (02)

Hint :

$$\int_0^{\pi} f^{-1}(x)dx = \int_{f^{-1}(0)}^{f^{-1}(\pi)} tf'(t)dt = \left[tf(t)\right]_{f^{-1}(0)}^{f^{-1}(\pi)} - \int_{f^{-1}(0)}^{f^{-1}(\pi)} f(t)dt$$

Sol. :

$$\int_0^{\pi} f^{-1}(x)dx = \int_{f^{-1}(0)}^{f^{-1}(\pi)} tf'(t)dt = \left[tf(t)\right]_{f^{-1}(0)}^{f^{-1}(\pi)} - \int_{f^{-1}(0)}^{f^{-1}(\pi)} f(t)dt$$

$f^{-1}(0) = 0$

$f^{-1}(\pi) = \pi$

$$= \pi^2 - \int_0^{\pi}(t + \sin t)dt$$

$$= \pi^2 - \left(\frac{t^2}{2} - \cos t\right)_0^{\pi} = \pi^2 - \frac{\pi^2}{2} - 2 = \frac{\pi^2}{2} - 2$$

Therefore, $k = 2$.

30. Answer (04)

Hint : $f(x) = [x] + |1 - x|,\ -1 \le x \le 3$

Sol. : $f(x) = [x] + |1 - x|,\ -1 \le x \le 3$

$= -x$ if $-1 \le x < 0$

$= 1 - x$ if $0 \le x < 1 = x$ if $1 \le x < 2$

$= x + 1$ if $2 \le x < 3$

$= 5$ if $x = 3$

Clearly f is not continuous at $x = 0, 1, 2$ and 3

31. Answer (03)

Hint : $f'(x) = \lim_{h\to 0}\frac{f(x+h) - f(x)}{h}$

Sol. : $f'(x) = \lim_{h\to 0}\frac{f(x+h) - f(x)}{h}$

$\therefore f'(x) = \lim_{h\to 0}\frac{f(x+h) - f(x)}{h}$

$$= \lim_{h\to 0}\frac{f\left(\frac{3x+3h}{3}\right) - f\left(\frac{3x+0}{3}\right)}{h}$$

$$= \lim_{h\to\infty} \frac{\frac{2+f(3x)+f(3h)}{3} - \frac{2+f(3x)+f(0)}{3}}{h}$$

$$= \lim_{h\to 0} \frac{f(3h)-f(0)}{3h-0} = f'(0)$$

$\Rightarrow f'(2) = f'(0) = 2$

$(\because f'(2) = 2)$

$\Rightarrow f'(x) = 2 \Rightarrow f(x) = 2x + c$

Put $x = y = 0$ in

$$f\left(\frac{x+y}{3}\right) = \frac{2+f(x)+f(y)}{3}$$

$\Rightarrow f(0) = 2$

Now, from equation (i), $f(0) = 0 + c = 2$

$\therefore c = 2$

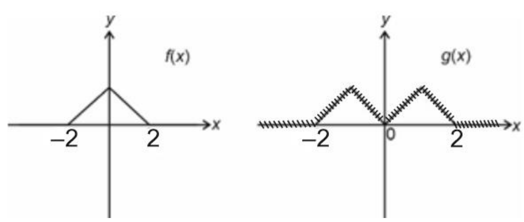
From equation (i), $f(x) = 2x + 2$

So, function $g(x) = |2|x| - 1|$, hence the points of non differentiability of $g(x)$ are $x = \pm(1/2), 0$.

32. Answer (05)

Hint : Plot the graph

Sol. :



33. Answer (B)

Hint : On differentiating a polynomial of n^{th} degree, we get another polynomial of $(n - 1)$ degrees.

Sol.: On differentiating a polynomial of n^{th} degree, we get another polynomial of $(n - 1)$ degrees.

So,

$f(x) = \{f'(x)\}^2 \Rightarrow n = 2(n-1) \Rightarrow n = 2$

34. Answer (D)

Hint : Let $f(x) = ax^2 + bx + c$

$\Rightarrow f'(0) = b > 0$

Sol. : Let $f(x) = ax^2 + bx + c$

$\Rightarrow f'(0) = b > 0$

Also, $f(x) = (f'(x))^2$

$\Rightarrow ax^2 + bx + c = 4a^2x^2 + 4abx + b^2 \; \forall \; x$

Thus, $a = 4a^2$, $b = 4ab$ and $c = b^2$

From which, we get $a = \frac{1}{4}$, since $(b \neq 0)$

Again,

$$\int_0^1 f(x)dx = \frac{19}{12}$$

$$\Rightarrow \frac{a}{3} + \frac{b}{2} + c = \frac{19}{12}$$

Therefore, $\frac{b}{2} + b^2 = \frac{3}{2}$

$\Rightarrow b = 1$

(since, (b > 0) and so c = 1)

Therefore,

$f'(0) = b = 1$

35. Answer (B)

Hint : Putting $x = 9$, $y = 0$ in the given equation of curve, we have

$$0 = 3a + 9b - \frac{1}{2} = \frac{a}{2\times 3} + b$$

Sol. : Putting $x = 9$, $y = 0$ in the given equation of curve, we have

$$0 = 3a + 9b - \frac{1}{2} = \frac{a}{2\times 3} + b$$

$\Rightarrow a = -3b$ …(1)

$$\frac{dy}{dx} = \frac{a}{2\sqrt{x}} + b$$

$$\left.\frac{dy}{dx}\right|_{(9,0)} = \frac{a}{6} + b = -\frac{1}{2} \quad \ldots(2)$$

Using Eqs. (1) and (2), we get

$b = -1$ and $a = 3$

Therefore,

$y = 3\sqrt{x} - x$

Point (1, 2) lies on curve as well as it is point of intersection of family of lines.

$$\frac{dy}{dx} = \frac{3}{2\sqrt{x}} - 1$$

$$\frac{dy}{dx} \text{ at } (1, 2) \text{ is } \frac{1}{2}$$

$$y - 2 = \frac{1}{2}(x - 1)$$

$\Rightarrow x - 2y + 3 = 0$

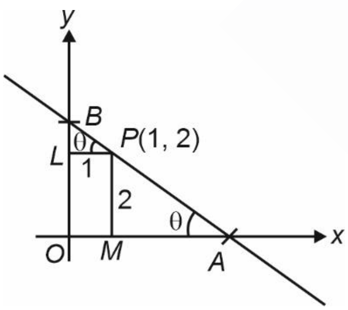
36. Answer (B)

Hint : $AB = AP + BP = 2\text{cosec}\theta + \sec\theta$

Sol. : $\sin\theta = \dfrac{2}{PA}$

$PA = 2\ \text{cosec}\theta$

$\cos\theta = \dfrac{1}{BP}$



$BP = \sec\theta$

$AB = AP + BP = 2\text{cosec}\theta + \sec\theta$

Therefore, minimum value of $AB = (2^{2/3} + 1)^{3/2}$

PART - III (PHYSICS)

37. Answer (A, C)

Hint : Apply lens maker's formula.

Sol. $\dfrac{1}{f} = (1.5 - 1)\left(\dfrac{2}{30}\right) = \dfrac{1}{30}$

$\therefore f = 30$ cm

Image will be at $2f$ and is real.

38. Answer (A, C, D)

Hint : If $\theta = 90°$, three images are formed.

Sol. : If $\theta = 90°$, three images are formed.

39. Answer (B, D)

Hint : Before $t = 0$, $i = \dfrac{v}{R}$

Just after $t = 0$, $i = \dfrac{v}{R}$

Sol. : Before $t = 0$, $i = \dfrac{v}{R}$

40. Answer (A, C, D)

Hint : $\Delta V_{PQ} = Blv$

Sol. : $\Delta V = Blv$, $R_{eq} = 2R$

$$i_{PQ} = \frac{Blv}{2R}$$

$$i_{R_1} = i_{R_2} = \frac{Blv}{4R}$$

41. Answer (A, D)

Hint : $I_{rms} = \sqrt{\dfrac{\int_0^{T_0} I_0^2 dt}{T_0}}$ and $I_{avg} = \dfrac{\int I dt}{\int dt}$

Sol. : $I_{rms} = \sqrt{\dfrac{\int_0^{T_0} I_0^2\, dt}{T_0}} = I_0$

$I_{avg} = I_0$ for half cycle as current remains constant.

42. Answer (B, C, D)

Hint : Circuit is in resonance.

Sol. : ΔV across LC combination = 0

Circuit is in resonance.

43. Answer (00)

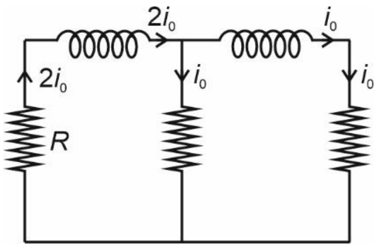
Hint : Find direction of induced electric field on OA.

Solution : There is no emf induced in BA and CD, since induced electric field is normal to AB and CD.

44. Answer (02)

Hint : Use the behaviour of the inductor concept.

Solution : After S is opened, current through inductor wouldn't change suddenly.



Required sum = $2i_0 + i_0 + i_0$

$= 4i_0$

45. Answer (12)

Hint : Find equivalent focal length of the system.

Solution : $\dfrac{1}{F} = 2\left(\dfrac{1}{f_{\text{lens}}}\right) + \left(\dfrac{1}{f_m}\right)$

$$= 2\left[(1.5-1)\left(\frac{1}{12} - \frac{1}{\infty}\right)\right] + \left(\frac{1}{\infty}\right)$$

$\Rightarrow f = 12$ cm

46. Answer (10)

Hint : Apply lens maker's formula

Sol. : $R = 10$ cm

$$-\frac{1}{20} = \left[\frac{1.5}{1+0.1t} - 1\right]\frac{2}{10}$$

$$\frac{3}{4} = \frac{1.5}{1+0.1t}$$

$t = 10$ s

47. Answer (02)

Hint : $\varepsilon = -L\dfrac{dI}{dt}$

Sol. :

$$\varepsilon = -L\frac{di}{dt} = Bv\ell$$

$$iB\ell = -\frac{mdv}{dt}$$

$$B\ell\frac{di}{dt} = m\frac{d^2v}{dt^2}$$

$$\frac{B^2\ell^2 v}{L} = -m\frac{d^2v}{dt}$$

$$m\frac{d^2v}{dt^2} + \frac{B^2\ell^2}{L}v = 0$$

$v = v_0\cos(\omega t)$

$$\omega = \frac{B\ell}{\sqrt{mL}}$$

$$v = v_0\cos\left[\frac{B\ell}{\sqrt{mL}} \times \frac{\pi\sqrt{mL}}{4B\ell}\right]$$

$$= \frac{v_0}{\sqrt{2}}$$

$$\Rightarrow \frac{1}{2}Li^2 = \frac{1}{2}m\left[v_0^2 - \frac{v_0^2}{2}\right]$$

$$\Rightarrow i = \sqrt{\frac{mv_0^2}{2L}}$$

48. Answer (04)

Hint : $\mu_1 \sin i = \mu_2 \sin r$

Sol. :

$\delta = 2i - 2r + \pi - 2r$

$= [\pi + 2i - 4r]$

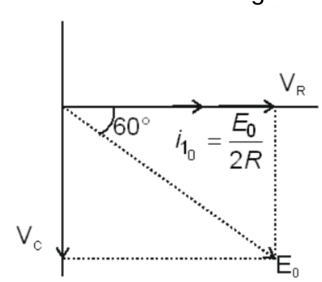
$\dfrac{\sin i}{\sin r} = \sqrt{3}$, δ is minimum at $\theta = \sin^{-1}\left(\dfrac{1}{3}\right)$

49. Answer (03)

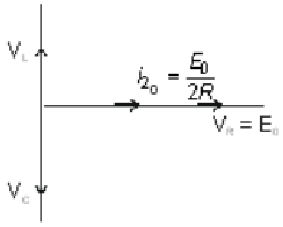
Hint : Draw phasor diagram

Sol. :

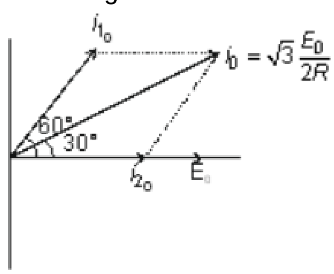
For branch containing R & C



For branch containing L, C & R



Combining both



i_0 leads E_0 by $\pi/6$

$$z = \frac{E_0}{i_0} = \frac{2R}{\sqrt{3}}$$

$$i_1 = \frac{E_0}{2R}\sin\left(\omega t + \frac{\pi}{3}\right)$$

$$i_2 = \frac{E_0}{2R}\sin\omega t$$

50. Answer (12)

Hint : $C = \frac{E_0}{B}$

Solution : $E_0 = CB_0 = (3 \times 10^8)\,(4 \times 10^{-6})$ V/m

$= 1200$ V/m

51. Answer (B)
52. Answer (B)

Hints and Solutions of Q. Nos. 51 & 52

Hint:

In LC oscillation, total energy is constant.

Solution:

$V_L = 0$

$$V_C = V_{2C} = V_0$$

$$\frac{1}{2}LI_1^2 + \frac{1}{2}(3C)V_0^2 = \frac{1}{2}(2C)\,4V_0^2 + \frac{1}{2}CV_0^2$$

$$I_1 = V_0\sqrt{\frac{6C}{L}}$$

$$t_0 = \frac{T}{4} = \frac{1}{4} \times \frac{2\pi}{\omega}$$

$$= \frac{\pi}{2}\sqrt{\frac{2LC}{3}}$$

53. Answer (C)

Hint : Use spherical refraction concept

Sol,. :

$$\frac{2}{V} + \frac{1}{x} = \frac{2-1}{R}$$

$$\left[\frac{2}{V} = \frac{1}{R} - \frac{1}{x}\right]$$

54. Answer (D)

Hint : Use spherical refraction concept

Sol. : $V = +4R$

Image is inverted and magnified

First refraction : $\frac{2}{v} - \frac{1}{-2R} = \frac{2-1}{R}$

$\Rightarrow v = 4R$

$$\Rightarrow m_1 = \frac{\frac{v}{\mu_2}}{\frac{u}{\mu_1}} = -1$$

For second refraction,

$m_2 = +1$

$\Rightarrow m_{net} = -1$

$\Rightarrow$ Inverted and of same size.

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