

Test Date: 29/07/2020



Aakash

Medical | IIT-JEE | Foundations
(Divisions of Aakash Educational Services Limited)

B
CODE

Regd. Office: Aakash Tower, 8, Pusa Road, New Delhi-110005, Ph.011-47623456

Mock Test
for JEE (Advanced) - 2021
Test - 3A (Paper - II)

ANSWERS

Physics

1. (A, C, D)
2. (A, B)
3. (A, C)
4. (A, C)
5. (B, D)
6. (A, C)
7. (15)
8. (75)
9. (12)
10. (15)
11. (02)
12. (50)
13. (06)
14. (16)
15. (A)
16. (B)
17. (B)
18. (A)

CHEMISTRY

19. (B, D)
20. (B, C)
21. (B, C, D)
22. (A, C, D)
23. (A, D)
24. (A, D)
25. (01)
26. (72)
27. (14)
28. (19)
29. (40)
30. (05)
31. (04)
32. (24)
33. (B)
34. (C)
35. (A)
36. (A)

MATHEMATICS

37. (A, B, C)
38. (A, B, D)
39. (A)
40. (A, B, C)
41. (C, D)
42. (A, B, C, D)
43. (27)
44. (02)
45. (05)
46. (06)
47. (50)
48. (02)
49. (06)
50. (04)
51. (B)
52. (A)
53. (C)
54. (A)

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ANSWERS & SOLUTIONS

PART – I : PHYSICS

1. Answer (A, C, D)

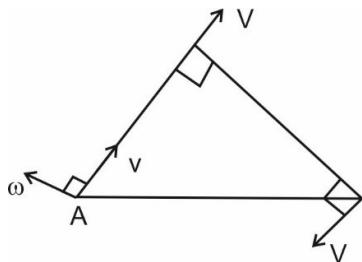
Theoretical

2. Answer (A, B)

for $x = 0$

$$c = \frac{5R}{2}$$

3. Answer (A, C)



$$\omega = \frac{2V}{\sqrt{3}a}$$

$$V_A = \sqrt{v^2 + (\omega a)^2}$$

$$V_A = \sqrt{v^2 + \frac{4v^2}{3}}$$

4. Answer (A, C)

Theoretical

5. Answer (B, D)

Draw force diagram for each current element

6. Answer (A, C)

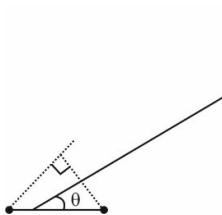
$$\text{At } O \text{ phase difference is } = 6\pi - \frac{2\pi}{3}$$

For maxima

till infinity phase difference varies from $\frac{16\pi}{3}$ to $-\frac{2\pi}{3}$

$$\frac{2\pi}{\lambda} \times \Delta x - \frac{2\pi}{3} = 4\pi$$

$$\Delta x = \frac{7\lambda}{3}$$



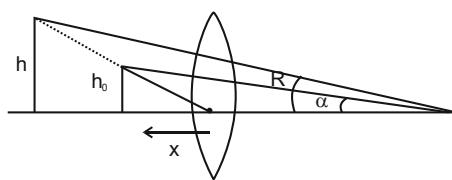
$$3\lambda \cos \theta = \frac{7\lambda}{3}$$

$$\cos \theta = \frac{7}{9} \Rightarrow \tan \theta = \frac{\sqrt{32}}{7}$$

$$\Rightarrow x = \frac{\sqrt{32}}{7} D$$

7. Answer (15)

$$y = \frac{fx}{f-x}$$



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

8. Answer (75)

$$V = V_0 \sin(\omega t + \theta)$$

$$\tan\theta = 3/4$$

$$I = I_0 \sin(\omega t)$$

$$V_R = I_0 \times 120 \sin(\omega t)$$

$$V_L = I_0 \times 90 \cos(\omega t)$$

9. Answer (12)

$$a_1 \cos 37^\circ = 2a_0$$

10. Answer (15)

$$P_0 h = \left[P_0 + \frac{kx}{3A} \right] \left[\frac{h}{2} + \frac{h}{3} \right]$$

$$\frac{6}{5} P_0 = P_0 + \frac{kh}{3A}$$

$$\frac{kn}{3A} = \frac{1}{5} P_0$$

$$k = \frac{3P_0 A}{5n}$$

11. Answer (02)

$$T = 2\pi \sqrt{\frac{R}{g \times 2}}$$

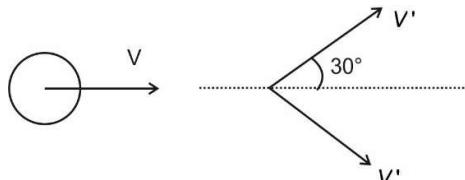
12. Answer (50)

$$10 = (2n + 1) \frac{\lambda}{4}$$

$$160 = \frac{m\lambda}{2}$$

$$\lambda_{\max} = 40 \text{ cm}$$

13. Answer (06)



$$V = 2V' \frac{\sqrt{3}}{2}$$

$$V' = \frac{V}{\sqrt{3}}$$

$$k = \frac{k}{3} + \frac{k}{3} + 10.2$$

$$\frac{k}{3} = 10.2, k = 30.6 \text{ eV}$$

14. Answer (16)

$$M = \int_0^R 4\pi r^2 \rho_0 \left(1 - \frac{r}{R}\right) dr$$

$$M = 4\pi \rho_0 \left[\frac{R^3}{3} - \frac{R^4}{4R} \right]$$

$$M = \frac{4\pi \rho_0 R^3}{12}$$

$$\rho_0 = \frac{3M}{\pi R^3}$$

$$E = \frac{GmM}{\pi R^3 R^2} \times \int_0^{R/2} 4\pi r^2 \left(1 - \frac{r}{R}\right) dr$$

15. Answer (A)

$$V = k\sqrt{S} \Rightarrow a = \text{constant}$$

16. Answer (B)

AB is isochoric

AC is isobaric

17. Answer (B)

$$I = \frac{25}{5} = 5A$$

$$V_c = 2.5[3 - 1] = 5V$$

18. Answer (A)

For L-R circuit current lags voltage

For RC Circuit current leads voltage

PART – II : CHEMISTRY

19. Answer (B, D)

$$dU = TdS - PdV$$

$$dG = VdP - SdT$$

20. Answer (B, C)

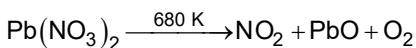
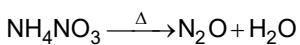
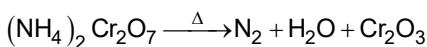
On addition of catalyst threshold energy get changed $\therefore \Delta G$ of the activated complex also get decrease.

21. Answer (B, C, D)

Only for 1s orbital of H the probability of finding an electron is maximum at 0.529 \AA .

$\psi = \frac{\pi}{\sqrt{2}} e^{r/a_0}$ is for 1s orbital of H-atom hence has no radical node and angular node.

22. Answer (A, C, D)



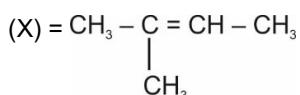
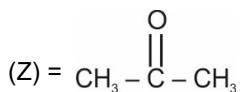
23. Answer (A, D)

$Mn^{+2} = 3d^5$ (has CFSE = 0)

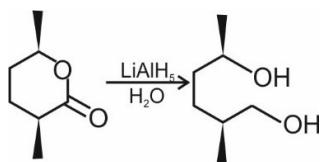
$[Co(C_2O_4)_3]^{3-}$ is diamagnetic

24. Answer (A, D)

(Y) = $CH_3 - CHO$



25. Answer (01)



26. Answer (72)

No of moles of Fe^{2+} reduce

$$n = \frac{1}{1 \times 96500} \times 96.5 \times 10^{-3} \times 3600 = 3.6 \times 10^{-3} \text{ moles}$$

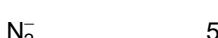
Volume of $KMnO_4$ required

$$5 \times 0.01 \times V(L) = 3.6 \times 10^{-3}$$

$$V(\text{ml}) = 72$$

27. Answer (14)

There will be no change in number of antibonding e^- Antibonding e^-



28. Answer (19)

The order of density is $Li < K < Na < Rb < Cs$

29. Answer (40)



$$5 \times 10^{-5} - y \quad x - y$$

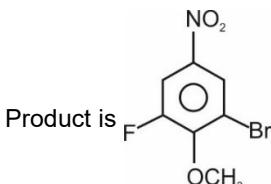
$$y = 3 \times 10^{-5}$$

$$(x - 3 \times 10^{-5})(2 \times 10^{-5}) = 10^{-10}$$

$$x - 3 \times 10^{-5} = 5 \times 10^{-6}$$

$$x = 3.5 \times 10^{-5}$$

30. Answer (05)



31. Answer (04)

Compounds P, Q, S and U are reducing in nature.

Which are in hemiacetal form compounds can reduce the Tollen's reagent

32. Answer (24)

$$NP = (No)_P \left(\frac{1}{2} \right)^{\frac{t}{200}}$$

$$NQ = (No)_Q \left(\frac{1}{2} \right)^{\frac{t}{50}}$$

$$4 = \frac{1}{64} \times \left(\frac{1}{2} \right)^{\frac{t}{200} - \frac{t}{50}}$$

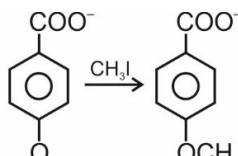
$$256 = (2)^{\frac{3t}{200}}$$

$$8 = \frac{3t}{200}$$

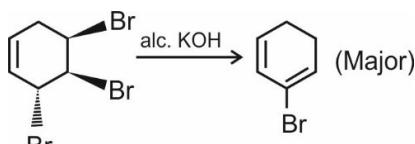
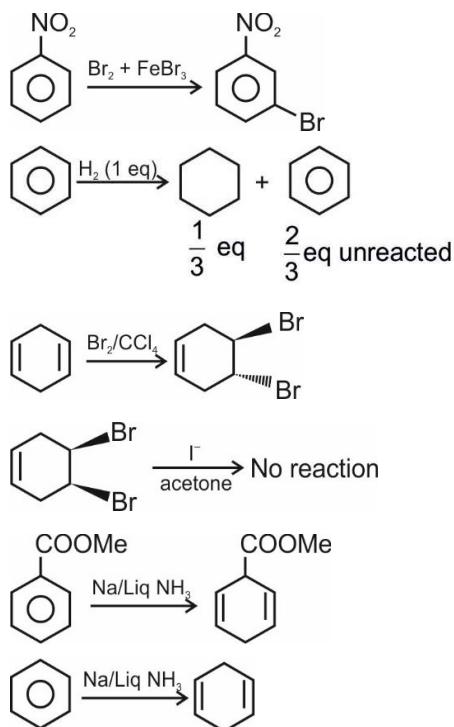
$$t = \frac{200 \times 8}{3}$$

$$9 \times \frac{t}{200} = 24$$

33. Answer (B)

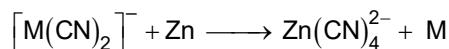
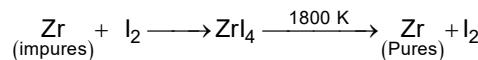


(more nucleophilic)



34. Answer (C)

Self-reduction – Cu, Pb

 $\text{M} = \text{Ag, Au}$

35. Answer (A)

Pyrrole being very weak base and very weak nucleophile will not react with PbSO_2Cl

36. Answer (A)

Graph can be predicted on the basis of Rate law and type of reaction involved

PART – III : MATHEMATICS

37. Answer (A, B, C)

$$\frac{x^2 - kx - 2}{x^2 - x + 1} < 2 \Rightarrow x^2 + x(a-2) + 4 > 0$$

$$\Rightarrow D < 0 \Rightarrow a \in (-2, 6) \quad \dots (\text{i})$$

$$-3 < \frac{x^2 - kx - 2}{x^2 - x + 1} \Rightarrow 4x^2 - x(a+3) + 1 > 0$$

$$\Rightarrow -7 < a < 1 \quad \dots (\text{ii})$$

$$(\text{i}) \cap (\text{ii}) \Rightarrow -2 < 0 < 1$$

$$-\left(\frac{\sqrt{3}+1}{2}\right) = -\sqrt{2} \cos 15^\circ > -2$$

$$\frac{\sqrt{2+\sqrt{2}}}{2} = \sqrt{\frac{1+\frac{1}{\sqrt{2}}}{2}} = \cos 22.5^\circ < 1$$

$$3 < 4 \Rightarrow \log_{\frac{1}{2}} 3 > -2$$

38. Answer (A, B, D)

$$2^{100}(2^3 + 1) + 2^n = k^{2P}$$

$$\Rightarrow 2^n = (k - 3.2^{50})(k + 3.2^{50})$$

$$\Rightarrow 2^a \cdot 2^{n-a} = (k - 3.2^{50})(k + 3.2^{50})$$

$$\Rightarrow 2^{n-a} - 2^a = 3.2^{51}$$

$$\Rightarrow 2^a (2^{n-2a} - 1) = 3.2^{51} \Rightarrow n - 2a = 2 \text{ & } a = 51$$

$$\Rightarrow n = 104 \Rightarrow S = 104$$

39. Answer (A)

$$\text{Let } a = (x-1)(2x-1)$$

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

$$c = 6x$$

Now

$$a + b + c = (x-1)(2x-1) - (x+1)(2x+1) + 6x$$

$$= (2x^2 - 3x + 1) - (2x^2 + 3x + 1) + 6x$$

$$\Rightarrow a^3 + b^3 + c^3 = 3abc$$

$$\Rightarrow I = \int \frac{x^{10}(5x^2 - 4)dx}{(-3(x-1)(2x-1)(x+1)(2x+1)6x)^3}$$

$$\Rightarrow I = -\frac{1}{18^3} \int \frac{x^{10}(5x^2 - 2)dx}{x^3((x^2 - 1)(4x^2 - 1))^3}$$

$$\begin{aligned}
 &= -\frac{1}{18^3} \int \frac{(5x^{-3} - 2x^{-5})}{((1-x^{-2})(4-x^{-2}))^3} \\
 &= -\frac{1}{18^3} \int \frac{(5x^{-3} - 2x^{-5})}{(x^{-4} - 5x^{-2} + 4)^3} \\
 x^{-4} - 5x^{-2} + 4 &= t \\
 \Rightarrow (-4x^{-5} + 10x^{-3})dx &= dt \\
 \Rightarrow 2(5x^{-3} - 2x^{-5}) dx &= dt \\
 \Rightarrow I = -\frac{1}{18^3} \times \frac{1}{2} \int \frac{dt}{t^3} \\
 &= -\frac{1}{2 \times 18^3} \left(\frac{t^{-2}}{-2} \right) + k \\
 &= \frac{1}{2^2 (2 \times 3^2)^3} \times \frac{1}{(x^{-4} - 5x^{-2} + 4)^2} + k \\
 &= \frac{1}{2^5 3^6} \frac{x^8}{((x^2 - 1)(4x^2 - 1))^2} + k \\
 \Rightarrow P &= \frac{1}{2^5 \times 3^6} \quad \dots(i)
 \end{aligned}$$

$$a = 1, b = 4$$

$ab = 4$ which is perfect square

$$bp = \frac{2^2}{2^5 \times 3^6} = \frac{1}{2^3 \times 3^6} \text{ which is perfect cube}$$

40. Answer (A, B, C)

$$0 < x < \frac{1}{2} \Rightarrow x^{2n} < x^2 \text{ for } n \geq 1$$

$$1 > 1 - x^{2n} > 1 - x^2 > 0$$

$$\Rightarrow 1 < \frac{1}{\sqrt{1-x^{2n}}} < \frac{1}{\sqrt{1-x^2}}$$

$$\Rightarrow \int_0^{\frac{1}{2}} dx < \int_0^{\frac{1}{2}} \frac{dx}{\sqrt{1-x^{2n}}} < \int_0^{\frac{1}{2}} \frac{dx}{\sqrt{1-x^2}}$$

$$\Rightarrow \frac{1}{2} < I < \frac{\pi}{6} \approx 0.0523$$

41. Answer (C, D)

$$\begin{aligned}
 P \text{ is centre of square} \Rightarrow AP = PC \text{ &} \\
 \angle APC = \frac{\pi}{2}, \angle ABC \text{ is also } \frac{\pi}{2} \\
 \Rightarrow BP \text{ is angular bisector} \\
 \text{Let } \arg\left(\frac{z_1 - z_2}{z_4 - z_2}\right) = -\alpha \\
 \Rightarrow \arg\left(\frac{z_3 - z_2}{z_4 - z_2}\right) = \alpha
 \end{aligned}$$

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

$$|A| = 1 \Rightarrow |\text{adj}(\text{adj}A)| = 1$$

43. Answer (27)

Taking O as origin let position vectors of A, B and C be \vec{a}, \vec{b} and \vec{c} respectively. Then the

$$\text{p.v. } G_1, G_2 \text{ and } G_3 \text{ are } \frac{\vec{b} + \vec{c}}{3}, \frac{\vec{c} + \vec{a}}{3} \text{ and } \frac{\vec{a} + \vec{b}}{3}$$

$$\Rightarrow V_1 = \frac{1}{6} [\vec{a} \ \vec{b} \ \vec{c}] \text{ and } V_2 = [\overrightarrow{OG_1}, \overrightarrow{OG_2}, \overrightarrow{OG_3}]$$

$$V_2 = \frac{1}{27} [\vec{b} + \vec{c} \ \vec{c} + \vec{a} \ \vec{a} + \vec{b}]$$

$$V_2 = \frac{2}{27} [\vec{a} \ \vec{b} \ \vec{c}]$$

$$\Rightarrow 9V_2 = 4V_1$$

44. Answer (02)

Given equation is $x^2 + 2x \sin(xy) + 1 = 0$

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

$$[x + \sin(xy)]^2 + \cos^2(xy) = 0$$

$$x + \sin(xy) = -x \quad \dots(i) \text{ and } xy = \pm \frac{\pi}{2}, \pm \frac{3\pi}{2}$$

$$\text{let } xy = \frac{\pi}{2}$$

$$(i) \Rightarrow 1 = -x \Rightarrow x = -1$$

$$(-1)y = \frac{\pi}{2} \Rightarrow y = -\frac{\pi}{2} \notin [0, 2\pi]$$

$$\text{Let } xy = -\frac{\pi}{2}$$

$$(i) \Rightarrow -1 = x \Rightarrow x = 1$$

$$(i) y = -\frac{\pi}{2} \Rightarrow y = -\frac{\pi}{2} \notin [0, 2\pi]$$

$$\text{Let } xy = \frac{3\pi}{2}$$

$$(i) \Rightarrow -1 = -x \Rightarrow x = 1$$

$$(i) y = \frac{3\pi}{2} \Rightarrow y = \frac{3\pi}{2} \in [0, 2\pi]$$

$$\text{Let } xy = -\frac{3\pi}{2}$$

$$(i) \Rightarrow 1 = -x \Rightarrow x = -1$$

$$(-1)y = -\frac{3\pi}{2} \Rightarrow y = \frac{3\pi}{2} \in [0, 2\pi]$$

$$(x, y) = \left(1, \frac{3\pi}{2}\right), \left(-1, -\frac{3\pi}{2}\right)$$

Numbers of order pairs = 2

45. Answer (05)

$$U_n = \int_0^1 x^n (2-x)^n dx, V_n = \int_0^1 x^n (1-x)^n dx$$

In U_n put $x = 2t$

$$dx = 2dt$$

$$V_n = 2 \int_0^{1/2} t^n (1-t)^n dt$$

$$V_n = 2 \int_0^{1/2} 2^{2n} t^n (1-t)^n dt$$

$$\Rightarrow U_n = 2^{2n} V_n$$

46. Answer (06)

$$K_i = \sum_{r=1}^n (i!) (r^{i-1})$$

$\Rightarrow k_1$ = either even or odd

k_2 = even, k_3 = even, k_4 = even

$$f(x) = (x-\alpha)^{k_1} (x-\beta)^{k_2} (x-\gamma)^{k_3} (x-\delta)^{k_4}$$

If k_1 = odd $\Rightarrow \alpha$ is point of inflection

So, no of maxima/minima

= 6 (1 each between (α, β) , (β, α) , (γ, δ) and 1 each at (β, γ, δ))

If k_1 = even $\Rightarrow \alpha$ is the point of maxima/minima

So, No of maxima/minima

= 7 (1 each between (α, β) , (β, α) , (γ, δ) and 1 each at $(\alpha, \beta, \gamma, \delta)$)

47. Answer (50)

$$y^2 = 12x$$

$$\Rightarrow y' = \frac{6}{y}$$

$$|\vec{v}| = 10 \text{ cm/sec}$$

$$\vec{v} = \frac{dx}{dt} \hat{i} + \frac{dy}{dt} \hat{j}$$

$$\frac{v_y}{v_x} = \frac{dy}{dx} = \frac{6}{y} = \frac{6}{6} = 1$$

So at $(3, 6) = v_x = v_y$

$$\Rightarrow |\vec{v}| = \sqrt{v_x^2 + v_y^2} = 10$$

$$\Rightarrow v_x^2 = 50$$

48. Answer (02)

49. Answer (06)

Let $Q(x) = x^4 - x^3 - x^2 - 1 = 0$ has roots

$\alpha, \beta, \gamma, \delta$ and

$$P(x) = (x^6 - x^5 - x^4 - x^2) + (x^4 - x^3 - x^2 - 1) + (x^2 - x + 1)$$

$$\Rightarrow P(x) = (x^2 + 1)Q(x) + x^2 - x + 1$$

$$\sum P(\alpha) = \sum \alpha^2 - \sum \alpha + 4$$

$$= (\sum \alpha)^2 - 2 \sum \alpha \beta - \sum \alpha + 4$$

$$= (1)^2 - 2(-1) - (1) + 4$$

$$= 6$$

50. Answer (04)

$$f(x) = ([x] + [-x] ([\sin x] + [-\sin x])) + x$$

$$= \begin{cases} x, & x \in I \\ x, & x = \frac{n\pi}{2}, n \in I \\ x+1, & \text{otherwise} \end{cases}$$

$\Rightarrow f(x)$ is discontinuous at integers and $\frac{n\pi}{2}$

So in $(0, \pi)$, $f(x)$ is discontinuous at 1, 2, 3 & $\frac{\pi}{2}$

51. Answer (B)

$$(A) \frac{\alpha + \beta + \gamma + \delta}{4} = 2 \text{ & } (\alpha\beta\gamma\delta)^{\frac{1}{4}} = 2$$

$$\Rightarrow \alpha = \beta = \gamma = \delta = 2$$

$$(B) \frac{\sin^2 \theta}{\sin^2 \phi} = 3, \frac{\tan^2 \theta}{\tan^2 \phi} = 9 \Rightarrow \frac{\cos^2 \theta}{\cos^2 \phi} = \frac{1}{3}$$

$$\text{Now } \sin^2 \phi + \cos^2 \phi = 1 \Rightarrow \frac{\sin^2 \theta}{3} + 3 \cos^2 \theta = 1$$

$$\Rightarrow \tan^2 \theta = 3$$

$$(C) \frac{\tan x}{\tan 3x} = 3 - \frac{8}{3 - \tan^2 x} < 3$$

$$(D) \text{ area} = \int_0^1 (a^2 + x^2 + ax + 1) dx \\ = \frac{a^2}{3} + \frac{a}{2} + 1$$

$$\text{Attains its least value when } a = -\frac{3}{4}$$

52. Answer (A)

$$(A) \sin^{10} x + \cos^{10} x \leq \cos^2 x + \sin^2 x \leq 1 \text{ & }$$

LHS is minimum when $\cos^4 x = 0$ and $\sin^6 x = 1$,

LHS is maximum when $\cos^4 x = 1$ and $\sin^6 x = 0$

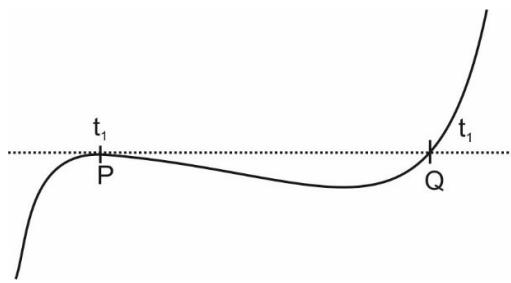
$$\Rightarrow 1 \leq \text{LHS} \leq 3$$

So LHS = RHS = 1

$$\Rightarrow \sin^6 x = 0 \text{ and } \cos^4 x = 0$$

$$(B) \frac{dy}{dt} = 1 - 9t^2, \frac{dx}{dt} = -6t$$

$$\frac{dx}{dt} = \frac{9t^2 - 1}{6t}$$



$$M_{PQ} = \frac{(t_2 - 3t_2^3) - (t_1 - 3t_1^3)}{(1 - 3t_2^2) - (1 - 3t_1^2)} \quad t_1 = -1 \text{ at P}$$

$$\text{But } M_{PQ} = \frac{9t_1^2 - 1}{6t_1} = \frac{1 - 3(t_2^2 + t_1^2 + t_1 t_2)}{-3(t_1 + t_2)}$$

$$\Rightarrow t_1 = -1 \text{ or } 2/3$$

$$m_{t_2} = \frac{9t_2^2 - 1}{6t_2} = \frac{4 - 1}{6 \times \frac{2}{3}} = \frac{3}{4}$$

$$m_{t_1} = \frac{9 - 1}{-6} = \frac{-4}{3} \Rightarrow \theta = \frac{\pi}{2}$$

(C) 1

$$(D) \text{ Avg} = \frac{1}{\frac{\pi}{2} - 0} \int_0^{\pi/2} \frac{\cos^2 x}{\sin^2 x + 4 \cos^2 x} dx$$

$$= \frac{2}{\pi} \int_0^{\pi/2} \frac{\sec^2 x}{(4 + \tan^2 x)(1 + \tan^2 x)} dx$$

$$= \frac{1}{6}$$

53. Answer (C)

$$(A) x = r \cos \theta, y = r \sin \theta$$

$$\Rightarrow x^2 + y^2 = r^2 \text{ & } \tan \theta = \frac{y}{x}$$

$$\Rightarrow x dy + y dx = r dr \text{ & } \frac{x dy - y dx}{x^2} = \sec^2 \theta d\theta$$

$$\Rightarrow x dy - y dx = r^2 \sec^2 \theta d\theta$$

= $r^2 \cos^2 \theta \sec^2 \theta d\theta$
 $\Rightarrow x dy - y dx = r^2 d\theta$
 So given differential equation is

$$\frac{r dr}{r^2 d\theta} = \sqrt{\frac{a^2 - r^2}{r^2}}$$

$$\Rightarrow \frac{dr}{\sqrt{a^2 - r^2}} = d\theta$$

$$\Rightarrow \sin^{-1} \left(\frac{r}{a} \right) = \theta + c$$

(B) $\rightarrow S$

(C) R

(D) Diff. w.r.t to x

$$\Rightarrow xy - \int_0^x y(t)dt = (x+1)xy + \int_0^x t y(t)dt$$

again d.w.r.t to x

$$y = x^2 y' + 2xy + xy$$

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

$$\Rightarrow y = \frac{c}{x^3} e^{-1/x}$$

54. Answer (A)

(A) Let $f(x) = x^2 - ax + 2$ We must have $e_1 < 1 < e_2$ Or, $f(1) < 0$

$$\Rightarrow 1 - a + 2 < 0 \Rightarrow a > 3$$

(B) $x^2 - ax + 2 = 0$ must have both roots greater than 1

$$D > 0 \Rightarrow a^2 - 4 > 0 \Rightarrow a \in (-\infty, -2) \cup (2, \infty)$$

$$\text{and } 1. f(1) > 0 \Rightarrow 1 - a + 2 > 0 \Rightarrow a < 3$$

$$\frac{a}{2} > 1 \Rightarrow a > 2$$

$$\text{So } a \in (2, 3)$$

$$(C) \frac{1}{e_1^2} + \frac{1}{e_2^2} = 1$$

$$\Rightarrow \frac{(e_1 + e_2)^2 - 2e_1 e_2}{(e_1 e_2)^2} = 1$$

$$\Rightarrow a = \pm 2\sqrt{2}$$

(D) We must have

$$e_2 < \sqrt{2} < e_1$$

$$f(\sqrt{2}) < 0 \Rightarrow 2 - a\sqrt{2} + 2 < 0$$

$$\Rightarrow a > 2\sqrt{2}$$

□ □ □