MOCK TEST JEE-2020
TEST-01 SOLUTION
Test Date :01-01-2020

ANSWER KEY

PHYSICS

Q.1 (2)	**Q.2** (1)	**Q.3** (2)	**Q.4** (1)	**Q.5** (2)	**Q.6** (1)	**Q.7** (1)	**Q.8** (1)	**Q.9** (4)	**Q.10** (4)
Q.11 (1)	**Q.12** (1)	**Q.13** (2)	**Q.14** (2)	**Q.15** (1)	**Q.16** (1)	**Q.17** (3)	**Q.18** (3)	**Q.19** (4)	**Q.20** (3)
Q.21 (0005)	**Q.22** (0009)	**Q.23** (1.70)	**Q.24** (0.12)	**Q.25** (0004)					

CHEMISTRY

Q.26 (2)	**Q.27** (2)	**Q.28** (1)	**Q.29** (3)	**Q.30** (3)	**Q.31** (2)	**Q.32** (2)	**Q.33** (3)	**Q.34** (2)	**Q.35** (2)
Q.36 (4)	**Q.37** (3)	**Q.38** (1)	**Q.39** (1)	**Q.40** (2)	**Q.41** (2)	**Q.42** (1)	**Q.43** (1)	**Q.44** (3)	**Q.45** (4)
Q.46 (0050)	**Q.47** (0.16)	**Q.48** (0003)	**Q.49** (0088)	**Q.50** (0003)					

MATHEMATICS

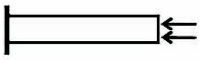
Q.51 (3)	**Q.52** (3)	**Q.53** (4)	**Q.54** (3)	**Q.55** (2)	**Q.56** (1)	**Q.57** (4)	**Q.58** (4)	**Q.59** (4)	**Q.60** (4)
Q.61 (4)	**Q.62** (3)	**Q.63** (2)	**Q.64** (3)	**Q.65** (1)	**Q.66** (4)	**Q.67** (3)	**Q.68** (3)	**Q.69** (3)	**Q.70** (3)
Q.71 (0038)	**Q.72** (0053)	**Q.73** (0001)	**Q.74** (4.5)	**Q.75** (0064)					

PHYSICS

Q.1 (2) In constant acceleration motion distance travelled in consecutive seconds are in ratio 1:3:5:7:9.....

Q.2 (1) Acceleration of weights $= \dfrac{\text{Net force}}{\text{total mass}} = \dfrac{(m_2 - m_1)g - f}{m_1 + m_2}$

Q.3 (2) For elastic head-on collision of equal masses, velocities get exchanged after the collision.

Q.4 (1) 

$\dfrac{dp}{dx} = -\rho\omega^2 x$

$p = \dfrac{\rho\omega^2 l^2}{2}$

$F = pA = \rho A l \dfrac{\omega^2 l}{2} = \dfrac{M\omega^2 L}{2}$

Q.5 (2) $m = 6 \times 10^{24}$ kg
$R = 6.4 \times 10^6$ m

$I = \dfrac{2}{5} mR^2$

$L = I\omega = \dfrac{2}{5} \times 6 \times 10^{24} \times (6.4 \times 10^6)^2 \times \dfrac{2\pi}{86400}$

$= \dfrac{12}{5} \times 0.39 \times 10^{34} \times \dfrac{2\pi}{8.64} \approx 10^{33}$

Q.6 (1) $f_n = nf_1 = 252$ Hz; $f_{n+1} = (n+1) f_1 = 336$ Hz.

Now $\dfrac{f_n}{f_{n+1}} = \dfrac{n}{n+1} = \dfrac{252}{336} \Rightarrow n = 3$

$\therefore f_1 = \dfrac{252}{3} = 84\text{Hz}$

Q.7 (1) Coefficient of performance $= \dfrac{T_{cold}}{T_{hot} - T_{cold}}$

$\beta_2 = \dfrac{246}{44}$ $\quad \beta_1 = \dfrac{263}{37}$ $\quad \beta_1 > \beta_2$

Q.8 (1) Distance of centre of each hole from the centre of mass of the plate increase. Also the shown triangle is equilateral and each side increases by same fraction and thus angle θ remains constant (= 60°)

Q.9 (4) Horizontally, all particles (i.e. cannonball and water particles) are flying with the same velocity. Hence water cannot come out of front / back / side holes. Vertically, all particles are experiencing free fall. Thus, gravity cannot exert any additional pressure on water and neither can water be slower than the cannonball. Hence no water can come out from top or bottom.

Q.10 (4) The output D for the given combination

$D = \overline{\overline{(A+B)}.C} = \overline{(A+B)} + \overline{C}$

If A = B = C = 0 then $D = \overline{(0+0)} + \overline{0} = \overline{0} + \overline{0} = 1 + 1 = 1$

If A = B = 1, C = 0 then $D = \overline{(1+1)} + \overline{0} = \overline{1} + \overline{0} = 0 + 1 = 1$

Q.11 (1) $3.9 \times 10^{-19} = n_1 e$, $6.5 \times 10^{-19} = n_2 e$, $9.1 \times 10^{-19} = n_3 e$
n_1, n_2 and n_3 are integers for $e = 1.3 \times 10^{-19}$

Q.12 (1) Disconnecting at 5, we get

$R + \dfrac{2R}{3} + R = \dfrac{8R}{3}$

Req. $= \dfrac{2R \times 8R/3}{2R + 8R/3} = \dfrac{16R}{14} = \dfrac{8R}{7}$

Q.13 (2) Magnetic moment of loop

$\mu = NIA = 100 \times \dfrac{1}{2} \times \pi r^2$

(Potential Energy) $U = -\vec{\mu}\cdot\vec{B}$

$\Delta U = U_f - U_i = -(-\mu B) - (-\mu B) = 2\mu B$

$= 2 \times 100 \times \dfrac{1}{2} \times \pi\left(\dfrac{1}{10}\right)^2 \times 2 = 2\pi J$

Q.14 (2) $-E_1 - iR - L\dfrac{di}{dt} + E_2 = 0$

Q.15 (1) If the object is kept at a distance of 2f, image will also form at the distance of 2f and that will be real and inverted. The distance between two lenses is arranged in such a way that the image from the first lens forms at 2f of the second lens.

Q.16 (1)

Q.17 (3) $E = \dfrac{E_0 Z^2}{n^2} = E_0 \Rightarrow n = Z = 3$,

for Lithium $r = \dfrac{r_0 n^2}{Z} = \dfrac{r_0 . 3^2}{3} = 3r_0$

Q.18 (3) ${}^{m}_{n}X \longrightarrow {}^{m-4}_{n}X + {}_2He^4 + 2\,{}_{-1}e^0$

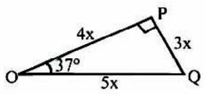
Q.19 (4) 29 division of main scale coincides with 30 divisions of vernier scale Hence one division of vernier scale

$= \dfrac{30-29}{30}$ of main scale

$= \dfrac{1}{30} \times 0.5° = \dfrac{1}{30} \times 0.5 \times 60$ min = 1 min.

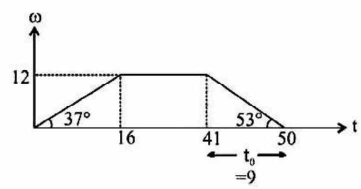
Q.20 (3) The physical size of antenna of reciver and transmitter both inversely proportional to carrier frequency.

Q.21 (0005) Bird (1) travels 7x and Bird (2) travels 5x in same time,



so $\dfrac{v_2}{v_1} = \dfrac{s_2}{s_1} = \dfrac{5x}{7x}$ or $v_2 = \dfrac{5}{7}(v_1) = 5$ km/hr

Q.22 (0009) $<\omega> = \dfrac{\int \omega\, dt}{\int dt} = \dfrac{\text{Area under graph}}{\text{time}} = \dfrac{\frac{1}{2} \times 12[25+50]}{50} = 9$ r/s



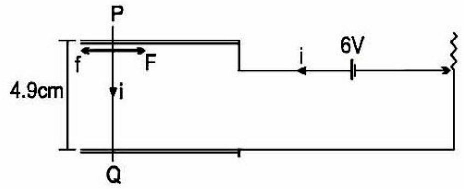
Q.23 (1.70) Power $\vec{F}.\vec{V} = PA\vec{V} = \rho ghAV$

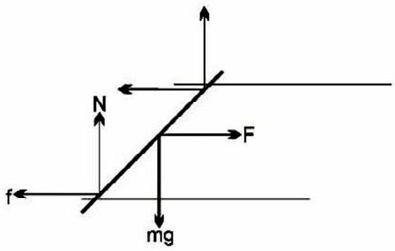
$\left[\because P = \frac{F}{A} \text{ and } P = \rho gh\right]$

$= 13.6 \times 10^3 \times 10 \times 150 \times 10^{-3} \times 0.5 \times 10^{-3} / 60$

$= \frac{102}{60} = 1.70$ watt

Q.24 (0.12)

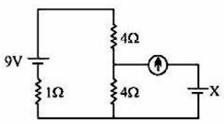




$$F = f_L$$
$$N = mg$$
$$BiL = \mu mg$$
$$\mu = \frac{BIL}{mg}$$

$$= \frac{0.8 \times \frac{6}{20} \times 4.9 \times 10^{-2}}{10 \times 10^{-3} \times 9.8} = 0.12$$

Q.25 (0004)



x = P.d. across 4Ω = 4V

CHEMISTRY

Q.26 (2) According to $(n + \ell)$ rule : 3p < 3d < 4p < 4d

Correct option : (2)

Q.27 (2) $n_{eq}.CaCO_3 = N_{eq}Ca(HCO_3)_2 + n_{eq}Mg(HCO_3)_2$

Or, $\frac{W}{100} \times 2 = \frac{0.81}{162} \times 2 + \frac{0.73}{146} \times 2$

$\therefore w = 1.0$

$\therefore \text{Hardmess} = \frac{1.0}{100} \times 10^6 = 10000\text{ppm}$

Correct option : (2)

Q.28 (1) Smaller the value of K, less favoured is the reaction in forward direction and more stable is the oxide.

Q.29 (3)

Q.30 (3) For cyclic process : $\Delta U = 0 \Rightarrow q = -w$

For isothermal process : $\Delta U = 0 \Rightarrow q = -w$

For adiabatic process : $q = 0 \Rightarrow \Delta U = W$

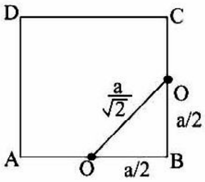
For isochoric process : $w = 0 \Rightarrow \Delta U = q$

Q.31 (2) In case of only C_2, incoming electron will enter in the bonding molecular orbital which increases the bond order and stability too. Whereas rest of all takes electron in their antibonding molecular orbital which decreases bond order and stability.

Q.32 (2)

Q.33 (3) Only structure 3-contains α – H atoms.

Q.34 (2) $\frac{a}{\sqrt{2}}$



Q.35 (2) $\lambda^o_m(HA) = 426.2 + 91 = 126.5 = 390.7 \text{ S cm}^2 \text{ mol}^{-1}$

$K_a = 10^{-5} = \frac{x^2}{0.1} \Rightarrow x = 10^{-3} = C\alpha \Rightarrow \alpha = 10^{-2}$

$\lambda_m = \alpha\lambda^0 = 3.907 \text{ S cm}^2 \text{ mol}^{-1}$

Q.36 (4) (1) $SiH_4 + 4H_2O \longrightarrow Si(OH)_4 + 4H_2\uparrow$

(2) $B_2H_6 + 6H_2O \longrightarrow 2B(OH)_3 + 6H_2\uparrow$

(3) $LiAlH_4 + 4H_2O \longrightarrow LiOH + Al(OH)_3 + 4H_2\uparrow$

(4) $\overset{+}{H}[Co(CO)_4]^- + \overset{+}{H}-OH^- \longrightarrow$ No reaction.

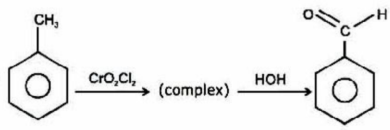
Q.37 (3) Donating atoms are both nitrogen & oxygen.

Q.38 (1) Microcosmic salt ($Na(NH_4)HPO_4.4H_2O$) is used for bead test.

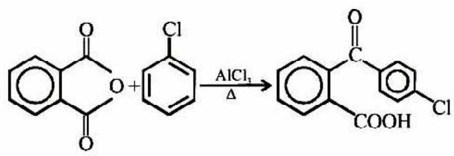
Q.39 (1) The upper stratosphere conists of ozone (O_3), which protect us from harmful ultraviolet (UV) radiations coming from sun.

Q.40 (2) is highly unstable.

Q.41 (2)



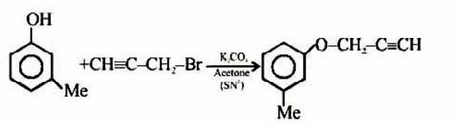
Q.42 (1)

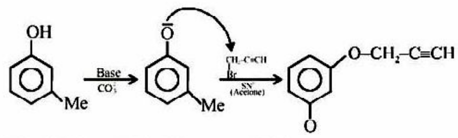


Q.43 (1) $CH_3-\overset{O}{\overset{\|}{C}}-OH \xrightarrow{SOCl_2} \underset{(B)}{CH_3-\overset{O}{\overset{\|}{C}}-Cl} \xrightarrow[\Delta]{Pd-BaSO_4} CH_3-\overset{O}{\overset{\|}{C}}-H$

Q.44 (3)

Q.45 (4)





Q.46 (0050) $Mn^{2+} + KMn^{+7}O_4 \longrightarrow Mn^{3+}$

mole of Mn^{2+} = mole of $KMnO_4 \times 4$

= vol. of $KMnO_4$ × molarity × 4
= 3 × 0.25 × 4 = 3
(in acidic medium,n-factor for $KMnO_4$ is 5 so molarity = normality /5)

mole of Mn_3O_4 = $\frac{1}{3}$ mole of Mn^{2+} = 1 mole = 229 gm

% of Mn_3O_4 = $\frac{229}{458} \times 100 = 50\%$

Q.47 (0.16) $i = \frac{\text{No. of particle after ionisation}}{\text{No. of particles before ionisation}}$

$$\begin{array}{lll} CuCl_2 \rightarrow & Cu^{2+} & + 2CL^- \\ 1 & 0 & 0 \\ (1-\alpha) & \alpha & 2\alpha \end{array}$$

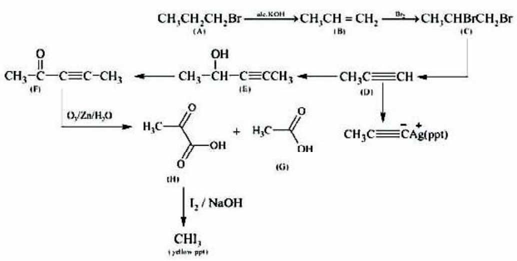
$i = \frac{1+2\alpha}{1}$, i = 1 + 2α

Assuming 100% inonization
So, i = 1 + 2 = 3
$\Delta T_b = i \times K_b \times m$

$\Delta T_b = 3 \times 0.52 \times 0.1 = 0.156 \approx 0.16$ $[m = \frac{13.44}{134.4} = 0.1]$

Q.48 (0003) Fusion occur along BC.
For fusion, Δq = 0.04 × 30 × 10^3J
For fusion T = 400 K

$$\Delta S_{fus} = \frac{\Delta q}{T} = \frac{40 \times 30}{400} = 3 \text{ J/mol K}$$

Q.49 (0088) 

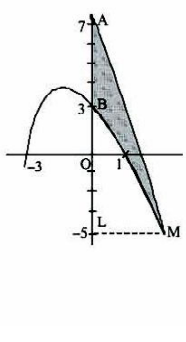
Molecular weight of compound (H) = 88

Q.50 (0003) Electron donating effect of – CH_3 group decreases electrophillicity of diazonium cation whereas electron with drawing effect of – NO_2 groups increases its electrophillicity increasing reactivity for diazocoupling. (II) , (IV) are more reactive than (I) whareas (III) , (V) & (VI) are less reactive than (I) .

MATHEMATICS

Q.51 (3) Given parabola $y = -x^2 - 2x + 3$

$\frac{dy}{dx} = -2x - 2$; $\left(\frac{dy}{dx}\right)_{(2,-5)} = -6$



Equation of tangent at (2, –5) is
y + 5 = –6(x – 2)
6x + y – 7 = 0
∴ required area MABM
= Area of ΔAML – Area of ΔBLMB

$= \frac{1}{2} \times 2 \times 12 - \left|\int_{-5}^{3} x\,dy\right|$

$= 12 - \left|\int_{-5}^{3} (-1+\sqrt{4-y})dy\right|$

$= 12 - \left|\left(-y - \frac{2}{3}(4-y)^{3/2}\right)_{-5}^{3}\right| = \frac{8}{3}$

Q.52 (3) tan θ = K

$$\frac{3\tan\frac{\theta}{3} - \tan^3\frac{\theta}{3}}{1 - 3\tan^2\frac{\theta}{3}} = K$$

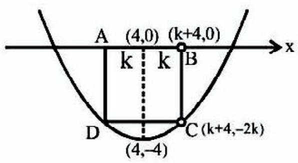
$\tan^3\frac{\theta}{3} - 3K\tan^2\frac{\theta}{3} - 3\tan\frac{\theta}{3} + K = 0$

Hence, $\sum \tan\frac{A}{3}\tan\frac{B}{3} = -3.$

Q.53 (4)

Let the side length be 2k

Now point ((k + 4), –2k) lies on parabola.



$y = x^2 - 8x + 12$

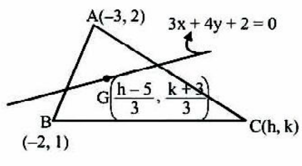
$(-2k) = (k + 4)^2 - 8(k + 4) + 12$

⇒ $k^2 + 2k - 4 = 0$

⇒ $k = \frac{-2+\sqrt{4+16}}{2} = 1 + \sqrt{5}$

So area = $4k^2 = 4(-1+\sqrt{5})^2 = 4(6-2\sqrt{5})$

Q.54 (3) Case-I : When exactly one of C & E is selected ${}^2C_1 \times 1$
Case-II : When both are selected
_ C D E
${}^2C_1$
Total ways → 4

Q.55 (2) 

$\therefore 3\left(\frac{h-5}{3}\right) + 4\left(\frac{k+3}{3}\right) + 2 = 0$

⇒ 3(h – 5) + 4(k + 3) + 6 = 0

$\therefore$ The locus of C(h, k) is $3x + 4y + 3 = 0$

Q.56 (1) $4 + 25 - 16 - 60 + P < 0$

$P - 47 < 0$

$P < 47$

Radius < x and y coordinate of centre

$\sqrt{16+36-P} < 4$ and 6

$\sqrt{52-P} < 4$ and 6

$52 - P < 16$ and 36

$-P < -36$ and -16

$P > 36$ and 16

$P \in (36, 47)$

Q.57 (4) Normal to parabola $x^2 = 4y$

is $y = mx + 2 + \frac{1}{m^2}$ ...(1)

Tangent to $y^2 = 12x$

$y = mx + \frac{3}{m}$ ...(2)

from (1) & (2) $\Rightarrow \frac{1}{m^2} + 2 = \frac{8}{m}$

$\Rightarrow 1 + 2m^2 = 3m \Rightarrow 2m^2 - 3m + 1 = 0$

$\therefore \; m_1 + m_2 = \frac{3}{2}$

Q.58 (4) By using condition of tangency, we get $4h^2 = 3k^2 + 2$

$\therefore$ Locus of P(h, k) is $4x^2 - 3y^2 = 2$ (which is hyperbola.)

Hence $e^2 = 1 + \frac{4}{3} \Rightarrow e = \sqrt{\frac{7}{3}}$ **Ans.**

Q.59 (4) Let $y = (mx + c)$ is tangent to $x^2 = 6y$.

So, $x^2 - 6mx - 6c = 0$

put disc = 0

$\Rightarrow c = \frac{-3}{2} m^2$

$\therefore$ we get $y = mx - \frac{3}{2} m^2$

Also, $\frac{x^2}{9/2} - \frac{y^2}{9/4} = 1$

So, using condition of tangency, we get

$\frac{9}{4} m^4 = \frac{9}{2} m^2 - \frac{9}{4}$

$\Rightarrow m^4 = 2m^2 - 1$ $\Rightarrow m^4 - 2m^2 + 1 = 0$

$\Rightarrow (m^2 - 1)^2 = 0$ $\Rightarrow m = \pm 1$

$\therefore$ For m = 1, we get $x - y = \frac{3}{2}$

Q.60 (4) $\frac{3}{ax + i\,by} - 2 = e^{i\theta}$

$\frac{3 - 2ax - 2iby}{ax + i\,by} = e^{i\theta}$

take modulus both sides

$(3 - 2ax)^2 + 4b^2y^2 = a^2x^2 + b^2y^2$

when a = 1 and b = 2 then

$\frac{(x-2)^2}{1} + \frac{y^2}{1/4} = 1$ which is an ellipse

when a = b = 1 then circle.

when a = 1 and b = 2 then $x^2 - 4x + 3 = 0$ represent pair o straight line.

Q.61 (4) $a = -1$; $b = 2$; $p = \frac{4}{9}$; $q = \frac{-5}{3}$

Q.62 (3) $\int_{\sin t}^{1} x^2 g(x)\,dx = (1 - \sin t)$

Differentiate w.r.t. t

$0 - \sin^2 t \cdot g(\sin t)\cos t = -\cos t$

$\therefore \; g(\sin t) = \frac{1}{\sin^2 t}$

Put $t = \frac{\pi}{4}$

$\therefore \; g\left(\frac{1}{\sqrt{2}}\right) = 2$

Q.63 (2) We have

$2c^2 - b^2 > b^2 + c^2$

$\Rightarrow c^2 > 2b^2$

$\Rightarrow \left|\frac{c}{b}\right| > \sqrt{2}$

Q.64 (3) $J = \int \frac{\sin^2 x + \sin x}{1 + \sin x + \cos x} dx$

$J = \int \frac{(1 + \sin x + \cos x) - \cos x - \cos^2 x}{(1 + \sin x + \cos x)} dx$

$J = \int 1dx - \int \frac{\cos x + \cos^2 x}{1 + \sin x + \cos x} dx$

$J = x - K + C$

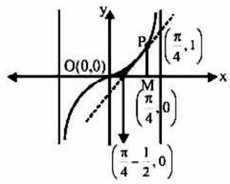
Q.65 (1) Using P–4, given integral becomes

$I = \int_0^{\pi/2} \frac{\cos(\pi/2 - x) - \sin(\pi/2 - x)}{1 + \sin(\pi/2 - x)\cos(\pi/2 - x)} dx$

$= \int_0^{\pi/2} \frac{\sin x - \cos x}{1 + \cos x \sin x} dx = -I$

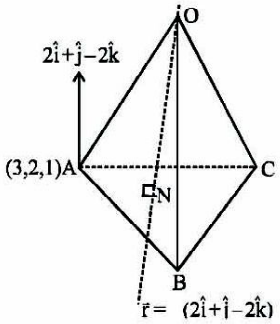
$\Rightarrow 2I = 0 \Rightarrow I = 0$

Q.66 (4)



Area $= \int_0^{\pi/4} (\tan x)dx - \frac{1}{2}\left(\frac{1}{2}\right)(1) = \frac{1}{2}\left(\ln 2 - \frac{1}{2}\right)$

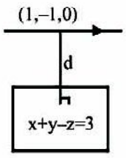
Q.67 (3)



Length of altitude = ON = length of projection of OA in the direction of $2\hat{i}+\hat{j}-2\hat{k}$

$$= \overrightarrow{OA}.\frac{2\hat{i}+\hat{j}-2\hat{k}}{3} = \frac{6+2-2}{3} = 2$$

Q.68 (3) Line is parallel to the given plane



$$\Rightarrow d = \frac{3}{\sqrt{3}} = \sqrt{3}$$

Q.69 (3) Probability $= \frac{71}{100} = 0.71$ Ans.

Q.70 (3) $T = \{(x, y) : x - y \in I\}$ as $O \in I$, T is a reflexive relation.
If $x - y \in I \Rightarrow y - x \in I$
$\therefore$ T is symmetrical also
If $x - y = I_1$ and $y - z = I_2$
Then $x - z = x - y + y - z$ and $I_1 + I_2 \in I$
$\therefore$ T is also transitive.
Hence, T is an equivalence relation on R.
S : {(x, y), y = x + 1 , 0 < x < 2
$(x, x) \in S$
$x = x + 1 \Rightarrow x = 0$
S is not equivalence relation on R.

Q.71 (0038) Let the total no. of terms in a G.P. is in the sum of first eleven terms is S_{11} and sum of last eleven is S'_{11} then

$$\frac{S_{11}}{S'_{11}} = \frac{1}{8} = \frac{a(r^{11}-1)(1-1/r)}{(r-1)(ar^{n-1})(1-1/r^{11})}$$

or $r^{11-n} = \frac{1}{8}$ ... (1)

$$\Rightarrow \frac{S_n - S_9}{S_n - S'_9} = 2 \Rightarrow \frac{\frac{a(r^n-1)}{(r-1)} - \frac{a(r^a-1)}{(r-1)}}{\frac{a(r^n-1)}{(r-1)} - \frac{ar^{n-1}(r^9-1)}{r^9\cdot(r-1)}\cdot r}$$

$$\Rightarrow \frac{(r^n-1)-(r^9-1)}{(r^n-1)-r^{n-9}(r^9-1)}$$

$\Rightarrow r^9 = 2$ ... (2)
by (1) & (2)
or $r^{11-n+27} = 1 = r^o$
or n = 38. **Ans.**

Q.72 (0053) $\sin^{-1}(\sin 8) = \sin^{-1}(\sin(3\pi - 8)) = 3\pi - 8$

$\tan^{-1}(\tan 10) = \tan^{-1}(\tan(10 - 3\pi)) = 10 - 3\pi$
$\cos^{-1}(\cos 12) = \cos^{-1}(\cos(4\pi - 12)) = 4\pi - 12$
$\sec^{-1}(\sec 9) = \sec^{-1}(\sec(9 - 2\pi)) = 9 - 2\pi$
$\cot^{-1}(\cot 6) = \cot^{-1}(\cot(6 - \pi)) = 6 - \pi$
$\text{cosec}^{-1}(\text{cosec } 7) = \text{cosec}^{-1}(\text{cosec }(7 - 2\pi)) = 7 - 2\pi$
$y = (3\pi-8) + (3\pi-10) + (4\pi-12) + (2\pi-9) + (-\pi+6) + (2\pi-7)$
$y = 13\pi - 40 \Rightarrow a = 13$ and $b = -40$
$\Rightarrow a - b = 13 - (-40) = 53$

Q.73 (0001) $y = \lim\limits_{x\to 0}(\cos x)^{\cot x}$

Taking log on both sides,

$\Rightarrow \log y = \lim\limits_{x\to 0} \cot x \log \cos x$

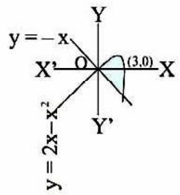
$\Rightarrow \log y = \frac{\log\cos x}{\tan x}, \left(\frac{0}{0}\text{ form}\right)$

Applying L-Hospital's rule,

$\Rightarrow \log y = \lim\limits_{x\to 0}\frac{-\tan x}{\sec^2 x} = 0$

$\Rightarrow y = e^0 \Rightarrow y = 1$

Q.74 (4.5) Given curves are, $y = 2x - x^2$ ...(i)
and $y = -x$ .... (ii)
Putting the value of y in (i)
$-x = 2x - x^2$
$\Rightarrow x(x - 3) = 0 \Rightarrow x = 0,3$
$\therefore$ area under the curve



$$= \int_0^3 [(2x - x^2) - (-x)]dx$$

$$= \int_0^3 (3x - x^2)dx = \left[\frac{3x^2}{2} - \frac{x^3}{3}\right]_0^3 = \frac{27}{2} - \frac{27}{3} = \frac{9}{2}.$$

Q.75 (0064) $P(n) : 49^n + 16n - 1$
$P(1) : 49 + 16 - 1 = 64$, which is divsible by 64
Let $P(k) : 49^k + 16k - 1 = 64\,m$
$\therefore P(k+1) : 49^{k+1} + 16(k+1) - 1 = 64\lambda$
L.H.S. of $P(k+1) = 49^{k+1} + 16(k+1) - 1$
$= 49(64m - 16k + 1) + 16k + 16 - 1$
[Assuming P(k) to be true]
$= 64(49m) - 48(16k) + 64$
$= 64(49m - 12k + 1) = 64\lambda$
Thus, P(k + 1) is divisible by 64 whenever P(k) is divisible by 64.
Hence, P(n) is divisible by 64. **Ans.**