AVIRAL CLASSES
CREATING SCHOLARS
JEE (ADVANCED), PMT & FOUNDATIONS

UTS- NEET -2020
MOCK TEST-05 SOLUTION

ANSWER KEY

PHYSICS

Ques.	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**	**21**	**22**	**23**	**24**	**25**
Ans.	3	4	4	3	3	2	4	4	1	3	1	4	2	2	3	1	2	3	2	2	3	1	4	3	2
Ques.	**26**	**27**	**28**	**29**	**30**	**31**	**32**	**33**	**34**	**35**	**36**	**37**	**38**	**39**	**40**	**41**	**42**	**43**	**44**	**45**					
Ans.	4	3	2	1	3	3	1	1	1	1	4	2	2	1	4	4	2	4	3	4					

CHEMISTRY

Ques.	**46**	**47**	**48**	**49**	**50**	**51**	**52**	**53**	**54**	**55**	**56**	**57**	**58**	**59**	**60**	**61**	**62**	**63**	**64**	**65**	**66**	**67**	**68**	**69**	**70**
Ans.	3	3	1	1	1	2	4	2	4	1	1	3	1	1	4	4	2	3	3	4	1	2	3	3	4
Ques.	**71**	**72**	**73**	**74**	**75**	**76**	**77**	**78**	**79**	**80**	**81**	**82**	**83**	**84**	**85**	**86**	**87**	**88**	**89**	**90**					
Ans.	2	1	1	1	1	1	2	4	3	2	4	1	3	1	4	1	2	3	1	4					

BIOLOGY

Ques.	**91**	**92**	**93**	**94**	**95**	**96**	**97**	**98**	**99**	**100**	**101**	**102**	**103**	**104**	**105**	**106**	**107**	**108**	**109**	**110**
Ans.	3	3	3	3	3	1	4	2	4	3	2	2	4	3	3	4	4	2	2	3
Ques.	**111**	**112**	**113**	**114**	**115**	**116**	**117**	**118**	**119**	**120**	**121**	**122**	**123**	**124**	**125**	**126**	**127**	**128**	**129**	**130**
Ans.	3	4	2	3	1	2	1	3	3	4	2	2	3	3	3	1	2	1	1	3
Ques.	**131**	**132**	**133**	**134**	**135**	**136**	**137**	**138**	**139**	**140**	**141**	**142**	**143**	**144**	**145**	**146**	**147**	**148**	**149**	**150**
Ans.	3	2	2	1	3	2	1	1	1	3	1	2	3	2	2	2	4	3	1	4
Ques.	**151**	**152**	**153**	**154**	**155**	**156**	**157**	**158**	**159**	**160**	**161**	**162**	**163**	**164**	**165**	**166**	**167**	**168**	**169**	**170**
Ans.	4	3	3	1	3	4	2	2	1	1	2	3	2	3	2	2	3	3	1	3
Ques.	**171**	**172**	**173**	**174**	**175**	**176**	**177**	**178**	**179**	**180**										
Ans.	4	1	2	3	1	3	2	3	3	3										

1.

$$F = \frac{GM_1M_2}{R^2}$$

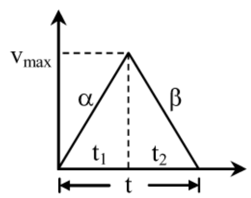
$$G = \frac{FR^2}{M_1M_2} = \frac{M^1L^1T^{-2}L^2}{M^1M^1} = M^{-1}L^3T^{-2}$$

2.

$$\vec{d} = 10\hat{i} + 12\hat{j} + 14\hat{j}$$

$$d = \sqrt{10^2 + 12^2 + 14^2} = 21 \text{ m}$$

3.



$$\alpha = \frac{v_{max}}{t_1} \Rightarrow t_1 = \frac{v_{max}}{\alpha}$$

$$\beta = \frac{v_{max}}{t_2} \Rightarrow t_2 = \frac{v_{max}}{\beta}$$

$$t = t_1 + t_2 = v_{max}\left(\frac{1}{\alpha} + \frac{1}{\beta}\right)$$

$$v_{max} = \frac{t\alpha\beta}{\alpha + \beta}$$

4.[3] $h = 0 + \frac{1}{2}gt^2$

$$t = \sqrt{\frac{2h}{g}} \Rightarrow \frac{t_1}{t_2} = \sqrt{\frac{a}{b}}$$

5.[3] Use $h = ut + \frac{1}{2}gt^2$

6.[2] $T = \frac{2u\sin\theta}{g}$

7.[4] $v = u + at$

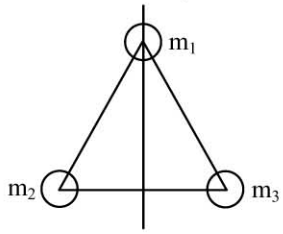
$0 = v - \mu gt$

$t = \frac{v}{\mu g}$

8.[4] $\frac{1}{2}\frac{m.2m}{m+2m}v_0^2 = \frac{1}{2}kx_0^2$

$k = \frac{2}{3}\frac{mv_0^2}{x_0^2}$

9.[1] $I = (m_2 + m_3).\frac{a^2}{4}$



10.[3] $\frac{KE_{rot.}}{KE_{tot.}} = \frac{\frac{k^2}{R^2}}{1+\frac{k^2}{R^2}}$

11.[1] $x = \frac{1}{2}$

12.[4] $L = 4.5 + 3 = 7.5$ m

13.[2] $x = d_{ac}\left(1 - \frac{1}{\mu}\right) = 1$ cm↑

14.[2] Same deviation

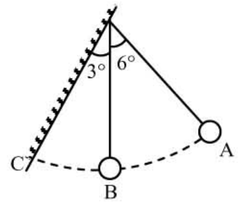
15.[3] Energy conserved

16.[1] $\beta \propto \lambda$

17.[2] $\delta = A(\mu - 1)$

18.[3] $\omega = \sqrt{\frac{g}{L}}$ $\therefore a_{max} = \omega^2 A = \frac{g}{L} \times A = 0.5$ m/s^2

19.[2]



Time taken by pendulum in going from A to B

$= \frac{T}{4}$ where $T = 2\pi\sqrt{\frac{\ell}{g}}$

Time taken by pendulum in going from B to C

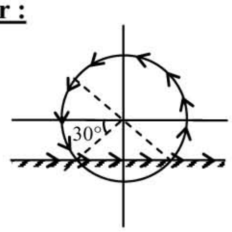
$= \frac{T}{12}$

$\therefore$ Time period of pendulum

$= 2\left(\frac{T}{4} + \frac{T}{12}\right)$

$= \frac{2T}{3} = \frac{2}{3}.\frac{\pi}{5} = \frac{2\pi}{15}$ sec

<u>Alter :</u>



$T' = \frac{240}{360}.T$

$= \frac{2}{3}T$

20.[2] $dB = 10\log\left[\frac{I}{I_0}\right] = 10\log\left[\frac{K/r^2}{I_0}\right]$

$= 10[\log(K') - 2\log r]$

$dB_1 = 10(\log K' - 2\log r_1)$

$dB_2 = 10(\log K' - 2\log r_2)$

$3 = dB_1 - dB_2 = 20\log\left[\frac{r_2}{r_1}\right]$

$\Rightarrow (0.3) = \log\left[\frac{r_2}{r_1}\right]^2$

$\Rightarrow \left(\frac{r_1}{r_2}\right) = \frac{1}{\sqrt{2}}$

21.[3] $\frac{n'}{n''} = \frac{V + V_s}{V - V_s} = \frac{5}{3}$

$3V + 3V_s = 5V - 5V_s$

$V_s = \frac{V}{4} = \frac{340}{4} = 85$ m/s

22.[1] $\text{slope} = \frac{nR}{P}$

23.[4] $V_{rms} = \sqrt{\frac{2^2 + 3^2 + 4^2 + 5^2}{4}}$

$= \sqrt{\frac{4 + 9 + 16 + 25}{4}} = \frac{\sqrt{54}}{2}$ cm/sec

24.[3] heat received by earth per sec. per unit area = S
so total heat per sec = $S \times \pi r^2$

25.[2] The decay constant λ is the reciprocal of the mean life τ.

Thus, $\lambda_\alpha = \frac{1}{1620}$ per year

and $\lambda_\beta = \frac{1}{405}$ per year

∴ Total decay constant, $\lambda = \lambda_\alpha + \lambda_\beta$

or $\lambda = \frac{1}{1620} + \frac{1}{405} = \frac{1}{324}$ per year

We know that $N = N_0\, e^{-\lambda t}$

When $\frac{3}{4}$ th part of the sample has disintegrated,

$N = N_0/4$

∴ $\frac{N_0}{4} = N_0 e^{-\lambda t}$

or $e^{\lambda t} = 4$

Taking logarithm of both sides, we get

$\lambda t = \log_e 4$

or $t = \frac{1}{\lambda}\log_e 2^2 = \frac{2}{\lambda}\log_e 2$

$= 2 \times 324 \times 0.693 = 449$ year

26.[4] Momentum should be conserved

$m_1 v_1 = m_2 v_2$

$\frac{4}{3}\pi r_1^2 dv_1 = \frac{4}{3}\pi r_2^3 dv_2$

$v_1 r_1^3 = v_2 r_2^3$

$\frac{v_1}{v_2} = \left(\frac{r_2}{r_1}\right)^3$

27.[3] $\lambda = \frac{h}{10^{-6} v} = \frac{h}{9.1\times10^{-31}\times3\times10^6}$

$\therefore v = 2.7 \times 10^{-18}$ m/s

28.[2] $Z = R$

$I = \frac{e}{R} = \frac{e_0}{\sqrt{2}R}$

29.[1] $\langle P \rangle = \frac{E_0 I_0}{2}\cos\phi$

30.[3] $I = \frac{12}{2k\Omega} = 6$ mA

31.[3] $n_h = N_A = 10^{21} \Rightarrow n_e = \frac{n_i^2}{n_h} = \frac{(10^{19})^2}{10^{21}}$

32.[1] NAND + NOT = AND

33.[1] $\tan\theta = \tan\theta' \cos\phi$

34.[1] $I_g = \frac{3}{50 + 2950} = \frac{3}{3000}$

$I_g = 1$ mA

∵ 30 ______________ = 1 mA

∴ 1 ______________ = $\frac{1}{30}$

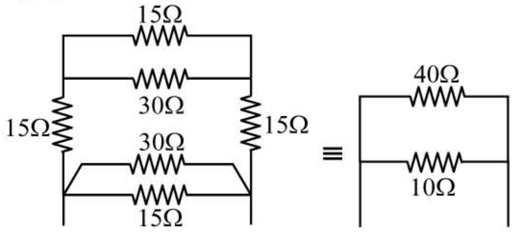
∴ 20 ______________ = $\frac{1}{30} \times 20$

$\frac{2}{3} = \frac{3}{50 + R}$

35.[1] $\frac{3}{8}\frac{\mu_0 I}{R} + \frac{\mu_0 I}{4\pi R}$

36.[4] $F = \frac{\mu_0 I_1 I_2}{2\pi}\left[\frac{1}{2\text{cm}} - \frac{1}{12\text{cm}}\right] \times 15$ cm

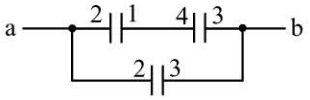
37.[2] By symmetrical line method



39.[1] $V = E - Ir$

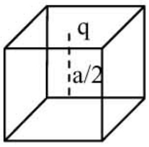
40.[4] $C = 4\pi\epsilon_0 a + \dfrac{4\pi\epsilon_0 ab}{b-a}$

41.[4]



42.[2] $F = \dfrac{2K\lambda_1\lambda_2}{r}$

43.[4]



6 plate cover closed area $= \dfrac{q}{\epsilon_0}$

1 ________________ $= \dfrac{q}{6\epsilon_0}$

44.[3] $\dfrac{Kq_1}{3r} + \dfrac{Kq_2}{3r} + \dfrac{Kq_3}{3r} = 0$

$q_1 + q_2 + q_3 = 0$

$\dfrac{Kq_1}{r} + \dfrac{Kq_2}{2r} + \dfrac{Kq_3}{3r} = 0$

CHEMISTRY

51.[2] $[H^+] = 10^{-2}$ $\quad\therefore\quad [H^+] = c\alpha$

$\alpha = \dfrac{10^{-2}}{0.1} = 0.1 \Rightarrow \alpha = \dfrac{i-1}{n-1}$

$0.1 = \dfrac{i-1}{2-1} \Rightarrow i = 1.1$

$\pi_{obs} = CST \times i = 0.1 \times R \times T \times 1.1$

52.[4] $2H^+ + 2e^- \rightarrow H_2$

$E_{Red} = E^o_{Red} - \dfrac{0.059}{2}\log\dfrac{P_{H_2}}{[H^+]^2}$

$= 0 - \dfrac{0.059}{2}\log\dfrac{100}{1} = -0.059$

55.[1] B does not contain vacant d-orbitals.

56.[1] Al passive in Conc. HNO_3

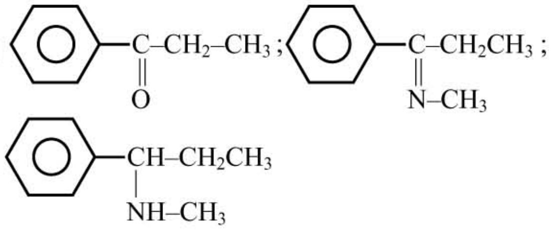
58.[1] XeF_2 & IF_2^- are sp^3d and linear shape.

61.[4] $\mu = \sqrt{n(n+2)}$

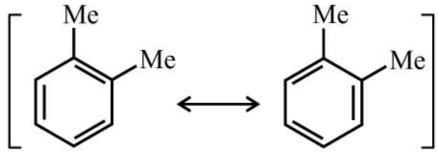
62.[2] $CuF_2 \Rightarrow Cu^{+2} = [Ar]3d^9$ n = 1, paramagnetic

64.[3] $[Cu(NH_3)_4]^{+2}$ dsp^2 n = 1

67.[2]

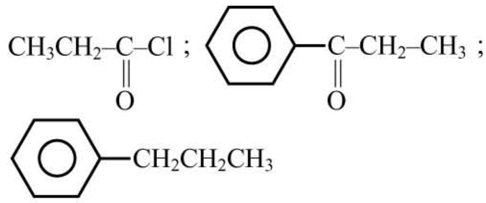


68.[3] o-xylene is



69.[3] Addition of $Br^{\oplus}$ & $\overset{\ominus}{OH}$ followed by intramolecular esterification.

73.[1]



74.[1] Apply Saytzeff's Rule

80.[2] $M = \dfrac{wRT}{PV} = \dfrac{2.91 \times 0.0821 \times 298}{1.09 \times 1.22}$

$= 53.47\ (B_4H_{10})$

81.[4] $T > \dfrac{\Delta H}{\Delta S}$

82.[1] Multiply the 2nd reaction by 3 and add with other two reaction –

$\dfrac{1}{4}P_4(s) + \dfrac{3}{2}H_2(g) \longrightarrow PH_3 \quad \Delta H = 1.2$ kcal

The desired $\Delta H = -1.2$ kcal × 4

$= -4.8$ kcal

84.[1] True

85.[4] True

86.[1] Due to stability of carbocation

$CH_3 - \overset{+}{C}HC_6H_5 > CH_3 - \overset{+}{C}H - CH_3 >$

$CH_3 - \overset{+}{C}H - Cl > CH_3 - \overset{+}{C}H - COOC_2H_5$

87.[2] NO_2 and O_3 are bent molecules with permanent dipole moments. CO_2 is linear molecule with zero dipole moment while SiF_4 is tetrahedral with zero dipole moment.

88.[3] Fact

89.[1]

$2AB_{2(g)}$	$\rightleftharpoons$	$2AB_{(g)}$	+	$B_{2(g)}$
1		0		0
$1-x$		x		$x/2$

$$\therefore\ K_p = \frac{x^2.x}{2(1-x)^2} \times \left[\frac{P}{1+\frac{x}{2}}\right]^1$$

x being small $\therefore\ 1 - x \approx 1$ and $1 + \frac{x}{2} \approx 1$

$$\therefore K_p = \frac{x^3.P}{2}$$