Monarch Institute
Success path for NEET Preparation

Class 12th Full Syllabus - Key

PHYSICS

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CHEMISTRY

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BOTANY

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ZOOLOGY

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2	2	4	4	4	3	1	1	3	3

SOLUTIONS

PHYSICS

PART -A

1. Ans (3)

$$x = \frac{x}{\sqrt{\frac{Q_2}{Q_1}} + 1} = \frac{80}{\sqrt{\frac{20}{10}} + 1} = 33 \text{ cm}$$

2. Ans (2)

Energy density = $= \frac{1}{2}\epsilon_0 E^2$

3. Ans (2)

$F = qE$

magnitude of force equal

5. Ans (1)

$$R_{eq} = \frac{25 \times 50}{75} = \frac{50}{3}\Omega$$

$$I = \frac{6}{50/3} = 0.36 \text{ A}$$

6. Ans (2)

$$V_d = \frac{i}{neA} = \frac{i}{ne\pi r^2}$$

$$V_d \propto \frac{i}{r^2}$$

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

8. Ans (3)

$$V_{COM} = \frac{C_1V_1 + C_2V_2}{C_1 + C_2} = \frac{20 \times 30 + 30 \times 20}{50}$$

= 24 volt

10. Ans (3)

$f = 25$ cm

$$m = \frac{-v}{u} = \frac{f}{f - u}$$

$$m = \frac{25}{25 - (-25)} = 0.5$$

11. Ans (4)

$\delta = i + e - A$ (for minimum derivation i = e)

$\therefore$ minimum deviation = 2i - A

$60 = 2 \times 60 - A \Rightarrow \because A = 60°$

$$n = \frac{\sin\left(\frac{A+\delta_m}{2}\right)}{\sin\left(\frac{A}{2}\right)} = \frac{\sin\left(\frac{60+60}{2}\right)}{\sin\left(\frac{60}{2}\right)} = \sqrt{3}$$

$\delta_1 = i_1 + e - A$

$65° = i_1 + 70° - 60°$ or $i_1 = 55°$

the δ versus i curve is not parabolic

12. Ans (4)

Using lens formula for objective lens

$$\frac{1}{v_0} - \frac{1}{u_0} = \frac{1}{f_0} \Rightarrow \frac{1}{v_0} = \frac{1}{f_0} + \frac{1}{u_0}$$

$$\Rightarrow \frac{1}{v_0} = \frac{1}{40} + \frac{1}{-200} = \frac{+5-1}{200} \Rightarrow v_0 = 50 \text{ cm}$$

Tube length $\ell = |v_0| + f_e = 50 + 4 = 54$ cm.

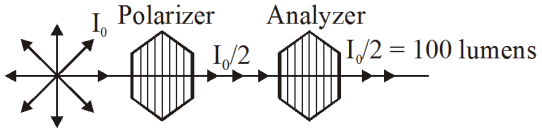
13. Ans (3)

$(y_8)_{\text{Bright, medium}} = (y_5)_{\text{Dark, air}}$

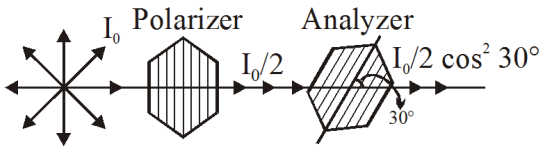
$$\frac{8\lambda_m D}{d} = \left(\frac{2(5)-1}{2}\right)\frac{\lambda D}{d}$$

$$\frac{8\lambda}{\mu}\frac{D}{d} = \frac{9}{2}\frac{\lambda D}{d} \Rightarrow \mu = \frac{16}{9} = 1.78$$

14. Ans (2)



Assuming initially axis of Polarizer and Analyzer are parallel



Now emerging intensity $= \frac{I_0}{2}\cos^2 30°$

$$= 100\left(\frac{\sqrt{3}}{2}\right)^2 = 100 \times \frac{3}{4} = 75 \text{ lumens}$$

15. Ans (4)

$$\sin\theta = \frac{m\lambda}{a}$$

when a increases, θ decreases,

width decreases

width decreases so intensity will increases

16. Ans (2)

NCERT Pg. No. # 147

17. Ans (4)

NCERT Pg. No. # 154

18. Ans (3)

NCERT Pg. No. # 169

19. Ans (3)

$$F = \frac{\mu_0 I_1 I_2 \ell}{2\pi r}$$

20. Ans (4)

$V = nI_g(G + R)$

$$R = \frac{V}{nI_g} - G = 900\Omega$$

22. Ans (3)

Case of Resonance

$$I = \frac{V}{R} = \frac{100}{40} = 2.5A$$

$V = V_L - V_C = 0$

24. Ans (3)

$\Delta\phi = NBA(\cos\theta_2 - \cos\theta_1)$

Here, $\theta_1 = 0°$ and $\theta_2 = 180°$

$\therefore \Delta\phi = nBA(\cos\theta_2 - \cos\theta_1)$

$$\therefore \text{Induced emf} = -\frac{\Delta\phi}{\Delta t} = \frac{2NBA}{\Delta t}$$

$$= \frac{2 \times 1 \times 0.1}{0.01} = 20V$$

The coil is closed and has a resistance of 2.0 Ω

Therefore, i = 20/2 = 10A

27. Ans (4)

K_{max} of photoelectrons doesn't depends upon intensity of incident light.

28. Ans (2)

$I_1 > I_2$ (given) $\Rightarrow i_1 > i_2$ [$\because i \propto I$]

and stopping potential does not depend upon intensity. So its value will be same (V_0).

34. Ans (2)

Diode is at RB hence No current

35. Ans (1)

$Y = \overline{\bar{A} + \bar{B}} = \bar{\bar{A}}.\bar{\bar{B}} = A.B$

Input		Output
A	B	y = A.B
1	1	1
0	0	0
0	1	0
1	0	0
1	1	1
0	0	0

PART -B

36. Ans (4)

Conducting surface behaves as equipotential surface.

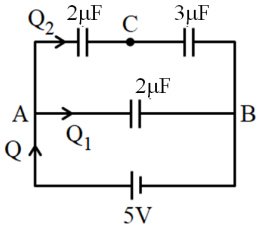
37. Ans (2)

Balanced WSB $\frac{P}{Q} = \frac{R}{S}$

$\frac{12}{0.5} = \frac{6+x}{0.5}$

$\Rightarrow x = 6\Omega$

38. Ans (1)



$C_{eq} = \frac{2\times 3}{5} + 2$

$= \frac{16}{5}\mu F$

$Q = \frac{16}{5} \times 5 = 16\mu C$

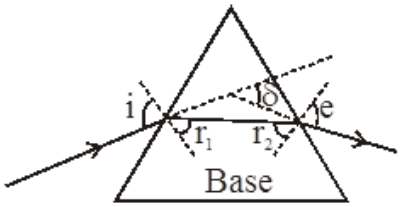
$Q_2 = 6\mu C$

$V_{BC} = \frac{6}{3} = 2V$

39. Ans (1)

Deviation is minimum in a prism when :

$i = e$, $r_1 = r_2$ and ray (2) is parallel to base of prism.



40. Ans (2)

Let v be the apparent depth of bubble then by using

$\frac{\mu_2}{v} - \frac{\mu_1}{u} = \frac{\mu_2 - \mu_1}{R}$

$\therefore \frac{1}{v} - \frac{1.5}{-4} = \frac{1-1.5}{-10}$

$\Rightarrow v = -\frac{40}{13} = -3.07$ cm

41. Ans (3)

$8\beta = 2.4$ cm; $\frac{8\lambda D}{d} = 2.4$cm

$\frac{8\times 1.5\times c}{0.3\times 10^{-3}\times f} = 2.4\times 10^{-2}$

$f = 5\times 10^{14}$ Hz

42. Ans (2)

$B_P = \frac{\mu_0 I}{4\pi r}(\sin\theta_1 + \sin\theta_2)$

$B_P = \frac{\mu_0 I}{4\pi(4\ell)} \times 2 \times \frac{3\ell}{5\ell}$

$B_P = \frac{3\mu_0 I}{40\pi\ell}.\otimes$

43. Ans (3)

$I = \frac{\text{Power}}{\text{Area}}$

$\Rightarrow \left(\frac{1}{2}\varepsilon_0 E_0^2\right).c = \frac{P_o}{4\pi r^2}$

47. Ans (4)

Here, $N = 500$, $A = 2\ m^2$, $\omega = 30\ rad\ s^{-1}$, $B = 0.20$ T, $R = 1000\ \Omega$

(a) Current, $I = \frac{\varepsilon_0}{R} = I_0 \sin\omega t = \frac{NBA\omega}{R}\sin\omega t$

Current is maximum when $\sin\omega t = 1$.

$I = \frac{500\times 0.20\times 2\times 30}{1000} = 6A$

48. Ans (3)

$\lambda = \frac{h}{\sqrt{2mqv}}$

$v \longrightarrow$ same

So $\lambda \propto \frac{1}{\sqrt{mq}}$

$\frac{\lambda_p}{\lambda_\alpha} = \sqrt{\frac{m_\alpha q_\alpha}{m_p q_p}}$

$= \sqrt{\frac{(4m_p)(2e)}{(m_p)(e)}}$

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

49. Ans (3)

Binding energy of $C^{12} = 12 \times 7.68 = 92.16$ MeV

Binding energy of $C^{13} = 13 \times 7.47 = 97.11$ MeV

$\therefore$ Energy required $= 97.11 - 92.16 = 4.95$ MeV

50. Ans (2)

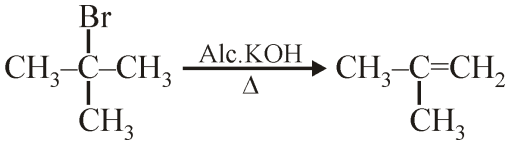
$n_e = N_D = 10^{21}\ m^{-3}$

$$n_h = \frac{n_i^2}{n_e} = \frac{(1.41 \times 10^{16})^2}{10^{21}} = 2 \times 10^{11} m^{-3}$$

CHEMISTRY

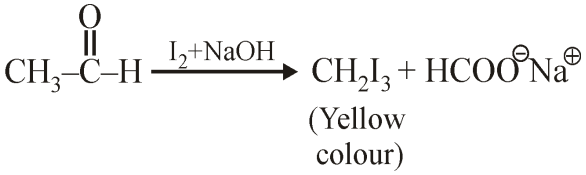
PART -A

51. Ans (2)

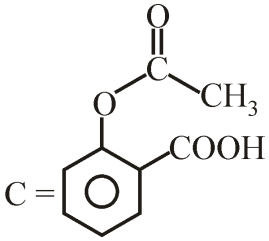


Reactivity $\propto$ Stability of Alkene

52. Ans (4)



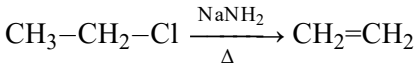
54. Ans (1)



55. Ans (1)

Theoretical fact

56. Ans (4)



63. Ans (3)

$$\text{Molality} = \frac{\text{Moles of solute}}{\text{Mass of solvent (in kg)}}$$

$$= \frac{5.2 \text{mol } CH_3OH}{1 \text{kg } H_2O} \qquad [1\ kg = 1000\ g]$$

$n_1(CH_3OH) = 5.2,\ n_2(H_2O) = \frac{1000}{18} = 55.56$

$\therefore \quad n_1 + n_2 = 5.20 + 55.56 = 60.76$ mol

$\therefore \quad x_{CH_3OH} = \frac{n_1}{n_1 + n_2} = \frac{5.2}{60.76} = 0.086$

64. Ans (2)

Given, $p° = 185$ torr at 20°C and $p_s = 183$ torr at 20°C

Mass of non. volatile substance, m =1.2 g

Mass of acetone taken = 100g and M = ?

As, we have $\frac{p_0 - p_s}{p_s} = \frac{n}{N}$

Putting the values, we get,

$$\frac{185 - 183}{183} = \frac{\frac{1.2}{M}}{\frac{100}{58}}$$

$$\Rightarrow \quad \frac{2}{183} = \frac{1.20 \times 58}{100 \times M}$$

$\therefore$

$$M = \frac{183 \times 1.2 \times 58}{2 \times 100} = 63.684 \approx 64\ g\ mol^{-1}$$

65. Ans (2)

$\Delta T_f = iK_f m \Rightarrow 0.0054 = i \times 1.86 \times 0.001$

$i = \frac{5.4}{1.86} \approx 3$

$[Pt(NH_3)_2Cl_2]Cl_2 \rightleftharpoons [Pt(NH_3)_2Cl_2]^{2+} + 2Cl^-$

So, ionisable Cl^- ions are 2.

66. Ans (1)

In solution, the surface has both solute and solvent molecules, thereby the fraction of the surface covered by the solvent molecules get reduced. Consequently, the number of solvent molecules escaping from the surface is reduced, thus vapour pressure of the solution is also reduced.

67. Ans (4)

The half reactions are

$$[Fe(s) \longrightarrow Fe^{2+}(aq) + 2e^-] \times 2$$

$O_2(g) + 4H^+ + 4e^- \longrightarrow 2H_2O$

$2Fe(s) + O_2(g) + 4H^+ \longrightarrow 2Fe^{2+}(aq) + 2H_2O(l)$

$$E = 1.67 - \frac{0.059}{4} \log \frac{(10^{-3})^2}{(10^{-3})^4 (0.1)} = 1.57V$$

68. Ans (2)

From Faraday's second law,

$$\frac{w_{H_2}}{w_{Cu}} = \frac{E_{H_2}}{E_{Cu}} \Rightarrow w_{H_2} = \frac{2}{63.5} \times 6.35 = 0.2g$$

70. Ans (1)

$$\frac{-\Delta[SO_2]}{\Delta t} = 2\left(-\frac{\Delta[O_2]}{\Delta t}\right)$$

$$\therefore \frac{-\Delta[SO_2]}{\Delta t} = 2 \times 2.5 \times 10^{-4} \text{ mol } L^{-1} s^{-1}$$

$$= 5.0 \times 10^{-4} \text{ mol } L^{-1} s^{-1}$$

$$= 50.0 \times 10^{-5} \text{ mol } L^{-1} s^{-1}$$

71. Ans (1)

$$10 \text{ g} \xrightarrow{t_{1/2}} 5 \text{ g} \xrightarrow{t_{1/2}} 2.5 \text{ g} \xrightarrow{t_{1/2}} 1.25 \text{ g}$$

$$3 \times t_{1/2} = 12\text{yr}$$

$$\therefore \quad t_{1/2} = \frac{12}{3} = 4\text{yr}$$

72. Ans (3)

Correct reason is threshold frequency for forward reaction is lower than that of backward reaction.

75. Ans (2)

$XeF_6 + H_2O \longrightarrow XeOF_4 + 2HF$

$XeF_6 + 2H_2O \longrightarrow XeO_2F_2 + 4HF$

$XeF_6 + 3H_2O \longrightarrow XeO_3 + 6HF$

79. Ans (2)

Energy absorb < splitting energy

$(E = h\nu)$

81. Ans (4)

boiling point :

$H_2S < H_2Se < H_2Te < H_2O$

82. Ans (4)

Carbon-carbon distance within the layer is less than between the layers.

83. Ans (1)

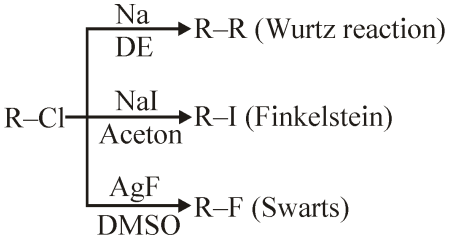
Ion with unpaired electron give coloured aqueous solution

84. Ans (3)

Actinoid contraction is more than lanthanoid contraction.

PART - B

86. Ans (2)



88. Ans (3)

Kjeldahl method cannot be used in detection of nitrogen in compound with nitro group, azo group and nitrogen in ring.

91. Ans (3)

K_H is a function of nature of gas and is different for different gases at a given temperature.

92. Ans (2)

Specific conductance = conductance × cell constant

$$1.3 \text{ Sm}^{-1} = \frac{1}{50} \text{ S} \times \text{cell constant}$$

$$\therefore \text{ Cell constant} = 1.3 \times 50 \text{ m}^{-1} = 65 \text{ m}^{-1} = (65/100) \text{ cm}^{-1}$$

$$\text{Molar conductivity} = \frac{1000 \times \text{conductance} \times \text{cell constant}}{\text{molarity}}$$

$$= \frac{1000}{0.4} \times \frac{1}{260} \times \frac{65}{100} = 6.25 \text{ Scm}^2\text{mol}^{-1}$$

$$= 6.25 \times 10^{-4} \text{ Sm}^2 \text{ mol}^{-1}$$

93. Ans (4)

Higher the SRP, better the oxidising agent. Among the given $E^\circ_{MnO_4^-/Mn^{2+}}$ is highest, hence MnO_4^- is the strongest oxidising agent.

94. Ans (1)

Since conductivity depends upon the number of ions per unit volume. Therefore, the conductivity of all electrolytes decreases on dilution due to decreases in number of ions per unit volume.

95. Ans (1)

A. Catalyst alters the rate of reaction by lowering activation energy.

B. Molecularity cannot be fraction or zero. If molecularity is zero, then reaction is not possible.

C. Second half-life of first order reaction is same as first because half-life time is independent on initial concentration of reactants.

D. $e^{-E_a/RT}$ refers to the fraction of molecules with kinetic energy equal to or greater than activation energy.

E. Energetically favourable reactions are sometimes slow due to improper orientation of molecule cause some ineffective collision of molecules.

F. Area under the Maxwell, Boltzmann curve is constant because total probability of molecules taking part in a chemical reaction is equal to one.

96. Ans (3)

$2CuSO_4+K_4[Fe(CN_6)] \longrightarrow Cu_2[Fe(CN)_6] \downarrow +2K_2SO_4$

(Chocolate brown)

97. Ans (1)

Stability of $\longrightarrow$

$[Pt(NH_3)_4 (SCN)_2]^{2+} < [Pt(NH_3)_4 (NCS)_2]^{2+}$

Strength of $\longrightarrow (SCN^-) < (NCS^-)$

99. Ans (2)

$Pb(NO_3)_2 \xrightarrow{\Delta} PbO + NO_2\uparrow + O_2\uparrow$

(A)

$NO_2 \xrightarrow{T\downarrow} N_2O_4$

$N_2O_4(s) \rightarrow NO^+(s) + NO_2^-(s)$

100. Ans (2)

$10I^- + 2MnO_4^- + 16H^+ \longrightarrow 2Mn^{2+} + 8H_2O + 5I_2$

BOTANY

PART - A

101. Ans (2)

NCERT XII Pg. # 35

102. Ans (2)

NCERT XII Pg. # 35

103. Ans (4)

NCERT XII Pg. # 35,36

104. Ans (2)

NCERT XII Pg. # 35

105. Ans (2)

NCERT XII Pg. # 34

106. Ans (2)

NCERT XII Pg. # 34

107. Ans (3)

NCERT Pg.# 233, 236

Module Pg.# 1

Module Pg.# 4

108. Ans (2)

NCERT_Page No. 238

109. Ans (1)

NCERT_Page No.242

110. Ans (1)

NCERT_Page No.242

112. Ans (1)

NCERT Page No. 233

114. Ans (3)

NCERT XII Pg.No. 263 (15.1.3)

115. Ans (4)

NCERT Page No. # 267

116. Ans (2)

NCERT Pg # 265

119. Ans (3)

NCERT Page - 187

120. Ans (4)

NCERT Page - 185

121. Ans (4)

NCERT Page - 182

122. Ans (2)

NCERT-XII, Pg.# 183

123. Ans (1)

NCERT Page - 183

124. Ans (2)

NCERT Page - 182

125. Ans (2)

NCERT Page # 69-71

126. Ans (3)

NCERT Page# 86-87

127. Ans (2)

NCERT Pg. # 75

132. Ans (4)

NCERT XII Pg.No.104

133. Ans (2)

NCERT XII Pg.No.89

134. Ans (1)

NCERT XII Pg.# 106

135. Ans (4)

NCERT XII Pg.# 99

PART - B

136. Ans (4)
NCERT XII Pg. # 33

137. Ans (4)
NCERT XII Pg. # 23

138. Ans (3)
NCERT Pg.# 236, 237
Module Pg.# 9

139. Ans (2)
NCERT_Page No.220

141. Ans (2)
NCERT XII Pg.No. 263 (15.1.3)
['a' is wrong]

142. Ans (2)
NCERT Page # 71-73

143. Ans (3)
NCERT Page % 82-86

144. Ans (4)
NCERT Page # 87,91

146. Ans (3)
NCERT XII Pg.No.108

147. Ans (2)
Module Pg.No.87

148. Ans (2)
NCERT XII Pg.# 111

149. Ans (3)
NCERT XII Pg.# 101

150. Ans (4)
NCERT XII Pg.No.106

ZOOLOGY

PART - A

160. Ans (1)
NCERT, Pg. # 31 [New]

166. Ans (4)
NCERT XII, Pg. # 130-131, Para - 7.3

169. Ans (2)
NCERT Pg. # 130, 131

170. Ans (1)
NCERT Pg # 131

172. Ans (3)
NCERT (XII) Pg. # 130 Fig. (7.2)

179. Ans (1)
NCERT Pg.# 196

185. Ans (3)
NCERT Pg # 209

PART - B

192. Ans (2)
NCERT XII Pg. # 51

195. Ans (4)
NCERT Pg. No. 48

198. Ans (1)
NCERT (XII) Page#132/142(H) Para:7.2