NEET TEST : HINTS / SOLUTIONS (06.05.2018)

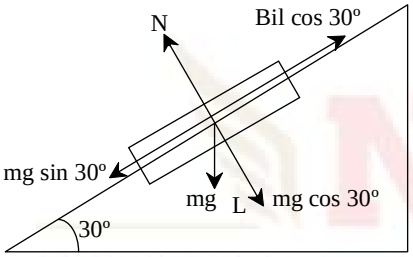
PHYSICS

1. **(1)** Current sensitivity = G × voltage sensitivity

$$\therefore \quad G = \frac{\text{Current sensitivity}}{\text{voltage sensitivity}}$$

$$= \frac{5}{10^{-3}\times 20} = \frac{500}{20} = 250\ \Omega$$

2. **(3)**



$$\therefore \quad mg\sin 30^\circ = Bil\cos 30^\circ$$

$$\therefore \quad \frac{m}{L}\frac{g}{B}\frac{\sin 30^\circ}{\cos 30^\circ} = i$$

$$\therefore \quad i = 0.5\times\frac{10}{0.25}\times\frac{i}{\sqrt{3}}$$

$$= \frac{5}{0.25\times 1.732} = 11.54A$$

3. **(3)** $Z = \sqrt{R^2 + \left(\omega L - \frac{1}{\omega C}\right)^2}$

$$= \sqrt{(25)^2 + \left(314\times 20\times 10^{-3} - \frac{1}{314\times 10^{-4}}\right)^2}$$

$Z = 56\Omega$

$P_{avg} = e_{rms}\, I_{rms}\cos\phi$

$$= e_{rms}\,\frac{e_{rms}}{Z}\cdot\frac{R}{Z} = \frac{e_{rms}^2}{Z^2}R$$

$$= \left(\frac{10}{\sqrt{2}}\right)^2\times\frac{50}{(56)^2} = 0.79W$$

4. **(3)**

5. **(4)** $\mu = \frac{\sin i}{\sin A}$

$$\sqrt{2} = \frac{\sin i}{\sin 30^\circ}$$

$$\sin i = \frac{1}{2}\times\sqrt{2} = \frac{1}{\sqrt{2}}$$

$i = 45^\circ$

6. **(4)**

7. **(4)** f = 15 cm u = –40 cm (concave)

$$\frac{1}{f} = \frac{1}{v}\times\frac{1}{u}$$

$u = -24$ cm

New position = u′ = –(40 – 20) = –20 cm

f = –15 cm u = –20 cm

$$\therefore \quad \frac{1}{f} = \frac{1}{v} + \frac{1}{u}$$

V = –60 cm

∴ image will be away from mirror by (60 – 24)

= 36 cm

8. **(3)** $U = 25\times 10^{-3}$ J

$I = 60\times 10^{-3}$ A

$$\therefore \quad U = \frac{1}{2}LI^2$$

$$\therefore \quad 25\times 10^{-3} = \frac{1}{2}\times(60\times 10^{-3})^2$$

$$\therefore \quad L = \frac{25\times 2\times 10^{-3}}{60\times 60\times 10^{-6}}$$

$$= \frac{50\times 10^{-3}}{36\times 10^{-4}} = \frac{50}{36}\times 10^{-4}$$

$$= \frac{500}{36} = 13.89H$$

9. **(2)** $\vec{V} = V_0\hat{i}$ $\quad \vec{E} = -E\hat{i}$

$$\lambda = \frac{\lambda}{mv}$$

Now,

$$\vec{V} = \vec{u} + \vec{a}t$$

$$\therefore \quad a = \frac{\vec{E}q}{m} \Rightarrow \vec{a} = -\frac{Eq}{m}\hat{i}$$

$$\vec{V} = V_0\hat{i} + \left(-\frac{Eq}{m}\hat{i}\right)t$$

but q = e

$$\therefore \quad \vec{V} = V_0\hat{i} + \left(-\frac{Eq}{m}\hat{i}\right)t$$

$$\left(V_0 + \frac{E_0 e}{m}t\right)\hat{i}$$

$$\therefore \quad \lambda_0 = \frac{\lambda}{mV_0} = \frac{\lambda}{m\left(V_0 + \frac{E_0 e}{m}t\right)}$$

$$\therefore \quad \frac{\lambda_0}{\lambda} = \frac{V_0 + \frac{E_0 e}{m}t}{V_0}$$

$$\therefore \quad \lambda = \frac{\lambda_0 V_0}{V_0 + \frac{E_0 e}{m}t} = \frac{\lambda_0}{\left(1 + \frac{eE_0}{mV_0}t\right)}$$

10. **(2)** **Case I**

$$2hv_0 = hv_0 + \frac{1}{2}mv_1^2$$

$$\frac{1}{2}mv_1^2 = hv_0 \qquad ...(1)$$

Case II

$$5hv_0 = hv_0 + \frac{1}{2}mv_2^2$$

$$\frac{1}{2}hv_2^2 = 4hv_0 \qquad ...(2)$$

equation (1) divided by equation (2)

$$\frac{v_1^2}{v_2^2} = \frac{1}{4} \quad \Rightarrow \frac{v_1}{v_2} = \frac{1}{2}$$

11. **(2)** $N = N_0\left(\frac{1}{2}\right)^{\frac{T}{t_{1/2}}}$

$N = (600 - 450) = 150$

$150 = 600\,(1/2)^{T/10}$

$(1/2)^2 = (1/2)^{T/10}$

$2 = T/10$

$T = 20$

12. **(4)** $\frac{KE}{TE} = \frac{me^4}{8\varepsilon_0^2 h^2 n^2} \Big/ -\frac{me^4}{8\varepsilon_0^2 h^2 n^2} = 1 : -1$

13. **(4)**

14. **(4)** $\beta = \frac{\lambda D}{d}, \qquad \beta \propto \frac{1}{d}$

$$\frac{\beta_1}{\beta_2} = \frac{d_2}{d_1} \qquad \frac{0.2}{0.21} = \frac{d_2}{2mm}$$

$d_2 = 1.9$ mm

15. **(1)**

16. **(1)** Initial power = P $\qquad$ Wave length = λ_0

Final power = nP $\qquad$ Wave length = $\frac{3}{4}\lambda_0$

W.K.T.; By Stefen's law

$$\frac{Q}{\Delta t} = \sigma T^4 \qquad \text{but } \frac{Q}{t} = P$$

$$\therefore \quad \frac{P}{A} = \sigma T^4 \qquad \therefore \quad P = A\sigma T^4$$

$$\therefore \quad T = \left(\frac{P}{\Delta\sigma}\right)^{\frac{1}{4}} \Rightarrow T \propto P^{1/4}$$

Now,

By Wein's law $\lambda = \frac{b}{T}$

$$\frac{\lambda_2}{\lambda_1} = \frac{T_1}{T_2} \qquad \therefore \frac{\lambda_2}{\lambda_1} = \left(\frac{P_1}{P_2}\right)^{\frac{1}{4}}$$

$$\therefore \quad \frac{\frac{3}{4}\lambda_0}{\lambda_0} = \left(\frac{P}{nP}\right)^{\frac{1}{4}} = \left(\frac{3}{4}\right)^4 = \frac{1}{n}$$

$$\therefore \quad n = \frac{256}{81}$$

17. **(2)** Length of wire 1 = l
Length of wire 2 = $l/3$
Area of wire 1 = A
Area of wire 2 = 3A
Wire 1

$$Y = \frac{F/A}{\Delta x/l} \quad ...(i)$$

Wire 2

$$Y = \frac{F'/3\times A}{\frac{\Delta x}{l/2}} \quad ...(ii)$$

From (i) and (ii)

$$\frac{F/A}{\Delta x/l} = \frac{F'/A}{\frac{9\Delta x}{l}} = F' = 9F$$

18. **(1)** $\frac{4}{3}\pi r^3\rho = \frac{4}{3}\pi r^3\sigma g + 6\pi\eta r v_t$

$\therefore$ Terminal velocity $= \frac{2r^2(\rho-\sigma)g}{9\eta}$

$\therefore$ $\frac{d\theta}{dt} = (6\pi\eta r v_t)v_t$

$$= \frac{8\pi(\rho-\sigma)^2 g^2 r^5}{27\eta} = \frac{d\phi}{dt} \propto r^5$$

19. **(4)** $dQ = du + p\Delta v$
$54 \times 4.18 = du + 1.013 \times 10^5 \times 167.1 \times 10^{-6}$
$226.75 = du + 16.25$
$\therefore$ $du = 208.72$ J

20. **(4)**

21. **(4)** $\frac{k_t}{k_t + k_r} = \frac{\frac{1}{2}mv^2}{\frac{1}{2}mv^2\left(1+\frac{k^2}{R^2}\right)}$

$$= \frac{1}{1+\frac{K^2}{R^2}} = \frac{1}{1+\frac{2}{5}} = \frac{5}{7}$$

22. **(3)**

23. **(3)**

24. **(3)** $\tau = \begin{vmatrix} \hat{i} & \hat{j} & \hat{k} \\ 4 & 5 & -6 \\ 0 & -2 & 1 \end{vmatrix}$

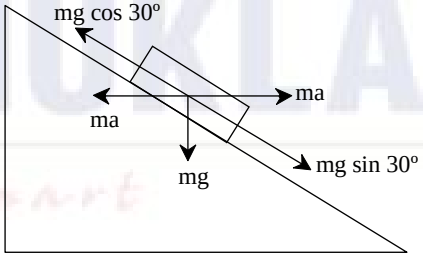
$r_1 = 2, 0, -3,$ $\quad r_2 = 2, -2, -2$
$\Delta r = 0, -2, +1$

$= \hat{i}(5-17) - \hat{j}(4) + \hat{k}(-8)$

$\tau = -7\hat{i} - 4\hat{j} - 8\hat{k}$

25. **(3)** Least count = 0.01 m
Main scale reading = 5 mm 0.5 cm
Division of circular scale = 25
Circular scale
Reading = $0.001 \times 25 = 0.025$
Total reading = 0.5 + 0.025 = 0.525
But error = –0.004
$\therefore$ final reading = 0.525 – (–0.004)
= 0.529 cm

26. **(3)**



At equilibrium
$ma\cos\theta = mg\sin\theta$

$a = g\frac{\sin\theta}{\cos\theta}$

$a = g\tan\theta$

27. **(4)** $F = qE$

$a = \frac{qE}{m}$

Displacement $= X_1 + X_2$

$X_1 = \frac{1}{2}at_1^2$ and $X_2 = st_2 + \frac{1}{2}at_2^2$

$t_1 = 1$ and $t_2 = 2$ sec.

$\therefore$ $X_1 = \frac{a}{2}$; $\quad X_2 = 12 - 2a$

$X = \frac{a}{2} + 12 - 2a$ $\quad X = 12 - \frac{3}{2}a$

Now, $a = \frac{v}{t} = 6$

$\therefore \quad X = 3m$

Avg velocity = $\frac{3}{3} = 1$ m/s

Now, distance = $X_1 + X_2$

$= \frac{6}{2} + X_2$

For 1 sec in X_2 it travels

$S = 6(1) - \frac{1}{2}at^2 = 3$

in 2 sec it travel = 6m

distance = 9m

$\therefore$ avg speed = 3 m/s

28. (4) For $\ell = \frac{\lambda}{4} + (n-1)\frac{\lambda}{2}$

$= \frac{\lambda}{2}n - \frac{\lambda}{4}$

$\ell = \left[\frac{(2n-1)}{4}\right]\lambda$

$20 = \frac{(2n-1)}{4}\lambda_1$ ....(i)

and $73 = \left[\frac{2n+1}{4}\right]\lambda_1$ ....(ii)

eq. (ii) divided by (i)

$\frac{73}{20} = \frac{2n+1}{2n-1}$

$\therefore \quad 53(2n) = 93$

$n = \frac{1}{2} \times \frac{93}{53}$

$\therefore \quad \lambda = \frac{20 \times 4}{\frac{93}{53} - 1} = \frac{80 \times 53}{40} = 106$ cm

$\therefore \quad v = f\lambda$

$= 320 \times 1.06 = 339$ m/s

29. (2) $F = Q.E$

$= Q \cdot \frac{\sigma}{2\varepsilon_0} = Q \cdot \frac{Q}{2\varepsilon_0 A} \quad \because \sigma = \frac{Q}{A}$

$F = \frac{Q^2}{2\varepsilon_0 A}$

Hence force is independent on distance between the plates.

30. (2) $n_1 = n_2$

$\frac{1}{2}a_1t_1^2 = \frac{1}{2}a_2t_2^2$

$a_1t_1^2 = a_2t_2^2$

$\frac{Eq_e}{m_e}t_1^2 = \frac{Eq_p}{m_p}t_2^2$

$\left(\frac{t_p}{t_e}\right)^2 = \sqrt{\left(\frac{m_e}{m_p}\right) \times \left(\frac{q_p}{q_e}\right)} = q_p = q_e$

$t_p = \sqrt{\frac{m_e}{m_p}}t_e$

$m_e < m_p$

$\therefore \quad t_p < t_e$

31. (4) | acceleration | = $\omega^2 x$

$20 = w^2 \times 5$

$\omega^2 = 4, \qquad \omega = 2$

$T = \frac{2\pi}{\omega} = \frac{2\pi}{2} = \pi$ sec

32. (2) For two cell

$I = \frac{2E}{2r} = \frac{E}{r}$

For n cell

$I = \frac{E}{r}$

$\therefore$ current does not depend on number of cells

33. (4)

34. (2) In first case resistance are in series :

$R_s = n \times R$

$I_1 = \frac{E}{nR + R} = \frac{E}{R(n+1)}$

2nd condition resistance are in parallel

$$R_p = \frac{R}{n}$$

$$I_2 = \frac{E}{\frac{R}{n} + R} = \frac{E}{R\left(\frac{1}{n}+1\right)}$$

$$\therefore \frac{I_2}{I_1} = 10 = \frac{\frac{E}{R}\left(\frac{1}{n}+1\right)}{\frac{E}{R(n+1)}}$$

$$10 = \frac{n+1}{n+1} \times n \Rightarrow n = 10$$

35. (4) Velocity required to escape from earth = 11.2 km/s

$$C = \sqrt{\frac{3KT}{m}}, \qquad C^2 = \frac{3KT}{M}$$

$$T = \frac{C^2 M}{3K} = \frac{(11.2\times10^3)^2 \times 2.76\times10^{-26}}{3\times1.38\times10^{-23}}$$

$$T = 8.36 \times 10^4 \text{ K}$$

36. (2) $$\frac{\Delta W}{\Delta Q} = \frac{n(C_P - C_V)\Delta T}{nC_P\Delta T} = \frac{C_P - C_V}{C_P}$$

$$= \frac{1-\frac{C_V}{C_P}}{1} = 1 - \frac{1}{\gamma}$$

$$\gamma_{mono} = \frac{5}{3}$$

$$\therefore \quad \frac{\Delta W}{\Delta Q} = 1 - \frac{1}{\frac{5}{3}} = \frac{2}{5}$$

37. (2) $$\frac{v}{2L_0} = \frac{3v}{4L_0}$$

$$\frac{1}{2L_0} = \frac{3}{4\times20}$$

$$2L_0 = \frac{4\times20}{3} = \frac{40}{3} = 13.2 \text{ cm}$$

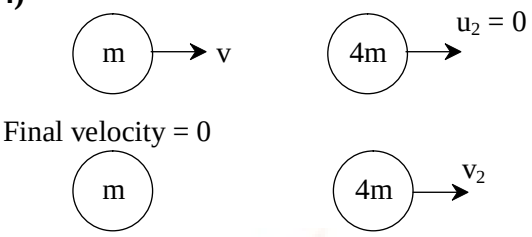
38. (2) $$\eta = \frac{T_1 - T_2}{T_1} \times 100$$

$$T_1 = (100 + 273)K$$

$$T_2 = 273 \text{ K}$$

$$\eta = \frac{373 - 273}{273} \times 100 = 26.8\%$$

39. (4)



$$e = \frac{v_2 - 0}{v - 0} = \frac{v_2}{v}$$

By conservation of linear momentum

$$P_1 = P_2$$

$$mv = 4mv_2$$

$$\frac{v}{v_2} = 4$$

$$\frac{v_2}{v} = \frac{1}{4} = 0.25$$

40. (3) $$mgh = \frac{1}{2}m(\sqrt{5rg})^2$$

$$h = \frac{5}{2}v = \frac{5}{2}\times\frac{D}{2} = \frac{5}{4}D$$

41. (2) By working energy principle

K.E. = Work done

$$\text{wok done} = \frac{1}{2}I\omega^2$$

$\because$ ω is same for all bodies

$$\text{but } I_{\text{solid sphere}} = \frac{2}{5}MR^2 = 0.4MR^2$$

$$I_{\text{thin circular disc}} = \frac{MR^2}{2} = 0.5MR^2$$

$$I_{ring} = MR^2 = MR^2$$

$$I_{ring} > I_{\text{thin circular}} > I_{\text{solid sphere}}$$

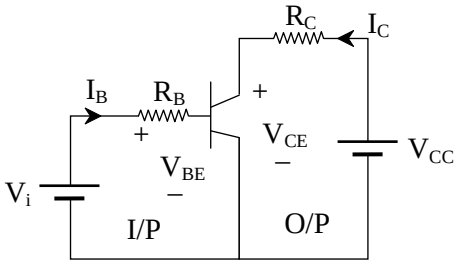
$$I_C > I_B > I_A$$

$$\therefore \quad W_C > W_B > W_A$$

42. **(3)**

43. **(4)** $y = A\bar{B} + \bar{A}B$

44. **(3)**



Apply KVL in Input side

$V_i = I_B R_B - V_{BE} = 0$

$V_i = 20V \qquad V_{BE} = 0$

$$\therefore \quad I_B = \frac{20}{5\times10^5} = 40mA$$

KVL in output side

$V_{CC} - I_C R_C - V_{CE} = 0$

$V_{CC} = 20V;\ V_{CE} = 0$ [grounded]

$$\therefore I_C = \frac{20}{4\times10^3} = 5mA$$

$$\therefore \beta = \frac{I_C}{I_B} = 125$$

45. **(3)**

BIOLOGY

46. **(4)** XI - NCERT Book Page No. 293-294

47. **(3)** XI - NCERT Book Page No. 298-299

48. **(2)** XI - NCERT Book Page No. 338

49. **(1)** XI - NCERT Book Page No. 312

50. **(4)** XI - NCERT Book Page No. 321

51. **(2)** XI - NCERT Book Page No. 323

52. **(2)** XII - NCERT Book Page No. 108

53. **(1)** XII - NCERT Book Page No. 116-117

54. **(3)** XII - NCERT Book Page No. 88

55. **(1)** XII - NCERT Book Page No. 50-51

56. **(4)** XII - NCERT Book Page No. 135

57. **(3)** XII - NCERT Book Page No. 131

58. **(2)** XII - NCERT Book Page No. 130

59. **(1)** XII - NCERT Book Page No. 153

60. **(4)** XII - NCERT Book Page No. 77

61. **(1)** XII - NCERT Book Page No. 181

62. **(2)** XII - NCERT Book Page No. 149

63. **(4)** XII - NCERT Book Page No. 267

64. **(1)** XII - NCERT Book Page No. 276, 278, 283, 284

65. **(2)** XII - NCERT Book Page No. 227

66. **(4)** XII - NCERT Book Page No. 158-159

67. **(3)** XII - NCERT Book Page No. 233

68. **(2)** XII - NCERT Book Page No. 61

69. **(2)**

70. **(3)** XII - NCERT Book Page No. 47

71. **(1)** XII - NCERT Book Page No. 53

72. **(2)** XI - NCERT Book Page No. 283-284

73. **(4)** XI - NCERT Book Page No. 271-272

74. **(2)** XI - NCERT Book Page No. 275

75. **(3)** XI - NCERT Book Page No. 278-279

76. **(4)** XI - NCERT Book Page No. 276

77. **(2)** XI - NCERT Book Page No. 307

78. **(3)** XI - NCERT Book Page No. 262

79. **(4)** XI - NCERT Book Page No. 58, 60

80. **(1)** XI - NCERT Book Page No. 58

81. **(3)** XI - NCERT Book Page No. 21

82. **(2)** XI - NCERT Book Page No. 52-56

83. **(4)** XI - NCERT Book Page No. 20

84. **(4)** XI - NCERT Book Page No. 112

85. **(3)** XI - NCERT Book Page No. 316

86. **(3)** XI - NCERT Book Page No. 133

87. **(3)** XI - NCERT Book Page No. 233

88. **(4)** XI - NCERT Book Page No. 258

89. **(2)** XI - NCERT Book Page No. 129

90. **(3)** XI - NCERT Book Page No. 139

91. **(2)** XI - NCERT Book Page No. 67

92. **(4)** XI - NCERT Book Page No. 67

93. **(2)** XI - NCERT Book Page No. 38-39

94. **(3)** XI - NCERT Book Page No. 91

95. **(4)** XI - NCERT Book Page No. 95

96. **(1)** XI - NCERT Book Page No. 22

97. **(2)** XI - NCERT Book Page No. 94

98. **(2)** XII - NCERT Book Page No. 79

99. **(4)** XII - NCERT Book Page No. 283-284

100. **(4)** XII - NCERT Book Page No. 104

101. **(3)** XII - NCERT Book Page No. 116

102. **(4)** XII - NCERT Book Page No. 7

103. **(2)** XII - NCERT Book Page No. 9

104. **(3)** XII - NCERT Book Page No. 23

105. **(1)**

106. **(4)** XII - NCERT Book Page No. 228

107. **(2)** XII - NCERT Book Page No. 248

108. **(3)**

109. **(3)** XII - NCERT Book Page No. 290

110. **(4)** XII - NCERT Book Page No. 282

111. **(3)** XII - NCERT Book Page No. 202

112. **(3)** XII - NCERT Book Page No. 283-284

113. **(2)** XII - NCERT Book Page No. 200

114. **(4)** XII - NCERT Book Page No. 214

115. **(3)** XII - NCERT Book Page No. 214

116. **(2)** XII - NCERT Book Page No. 115

117. **(1)** XII - NCERT Book Page No. 197

118. **(4)** XII - NCERT Book Page No. 237

119. **(1)** XII - NCERT Book Page No. 24

120. **(3)** XII - NCERT Book Page No. 34

121. **(2)** XI - NCERT Book Page No. 208

122. **(4)** XI - NCERT Book Page No. 233

123. **(2)** XI - NCERT Book Page No. 197

124. **(4)** XI - NCERT Book Page No. 134

125. **(3)** XI - NCERT Book Page No. 145

126. **(2)** XI - NCERT Book Page No. 24

127. **(1)** XI - NCERT Book Page No. 187

128. **(4)** XI - NCERT Book Page No. 215

129. **(3)** XI - NCERT Book Page No. 138

130. (1) XI - NCERT Book Page No. 168

131. (2) XI - NCERT Book Page No. 89

132. (3) XI - NCERT Book Page No. 11, 12, 13, 14

133. (2) XI - NCERT Book Page No. 133

134. (1) XI - NCERT Book Page No. 24

135. (3)

CHEMISTRY

136. (2) (1) 10^{-4} mol
(2) 1 mol
(3) 10^{-3} mol
(4) 10^{-2} mol

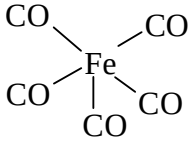
137. (4) $t_{1/2} = \frac{0.693}{k}$, $t_{1/2} = \frac{1}{k[A]_0}$
(1st order)

138. (3)

139. (2) $Be^{2+} < Ca^{2+} < Ba^{2+}$ size
$BeH_2 < CaH_2 < BaH_2$ ionic character

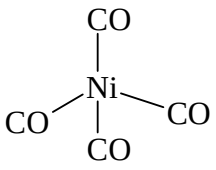
140. (3) $_{25}Mn^{7+}$ – [Ar]$4s^0\ 3d^0$
$_{24}Cr^{6+}$ – [Ar] $4s^0\ 3d^0$
$_{25}Mn^{6+}$ – [Ar] $4s^0\ 3d^1$
$_{24}Cr^{6+}$ – [Ar] $4s^0\ 3d^0$

141. (4)

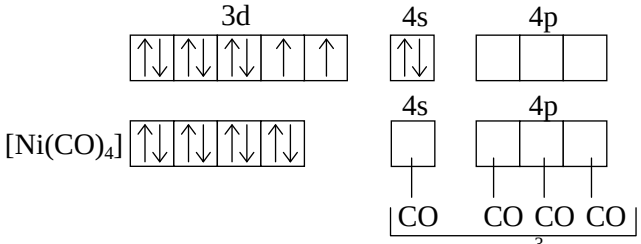


142. (2) (a) $_{27}Co^{3+}$ – [Ar] $4s^0\ 3d^6$
(b) $_{24}Cr^{3+}$ – [Ar] $4s^0\ 3d^3$
(c) $_{26}Fe^{3+}$ – [Ar] $4s^0\ 3d^5$
(d) $_{28}Ni^{2+}$ – [Ar] $4s^0\ 3d^8$

143. (4)

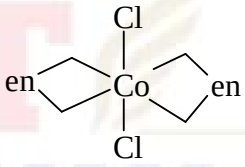


$_{28}Ni$ – [Ar] $3d^8\ 4s^2$

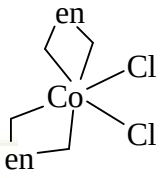


Tetrahedral and diamagnetic sp^3

144. (2)



trans

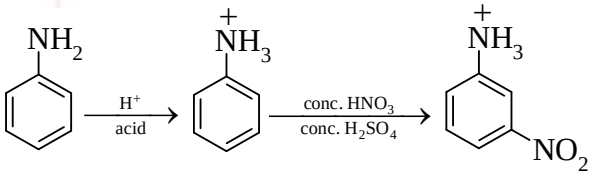


cis

145. (2) optical and

146. (3)

147. (3)



m-product

148. (4) Acidic character
BeO > MgO > CaO > BaO

149. (1) $n_{HCOOH} = \frac{2.3}{46} = 0.05$ mol

$n_{H_2C_2O_4} = \frac{4.5}{90} = 0.05$ mol

$HCOOH \xrightarrow{\text{conc. } H_2SO_4} H_2O + CO$
0.05 mol 0.05 mol

$H_2C_2O_4 \longrightarrow H_2O + CO + CO_2$
0.05 mol 0.05 mol 0.05 mol

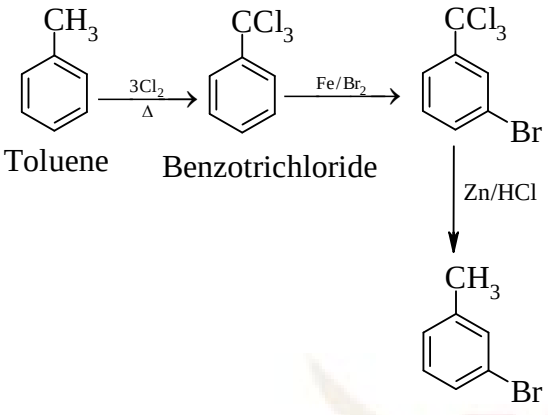
CO_2 absorbed by KOH

$n_{CO} = (0.05 + 0.05) = 0.1$ mol
$= 0.1$ mol $\times$ 28 g $mol^{-1} = 2.8$ g

150. (3) $CH_4 \xrightarrow{Br_2} CH_3Br \xrightarrow{2Na} CH_3 - CH_3$

151. (2)

152. (2)



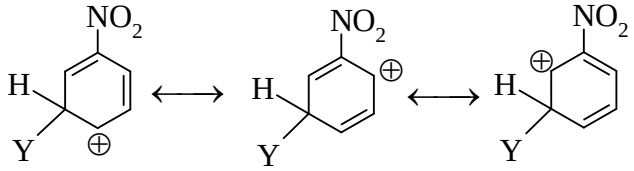
Toluene Benzotrichloride m-bromo toluene

153. (3) $CH_3CH_2OH + Na \longrightarrow CH_3CH_2ONa$ (A) (B)

$\downarrow PCl_5$

CH_3CH_2Cl (C)

154. (1)

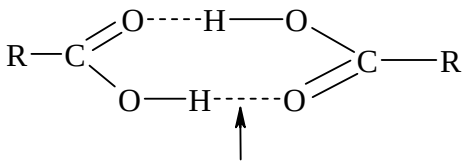


All are stable resonating structures

155. (2, 4)

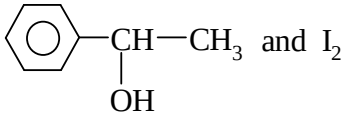
156. (4) $\overset{sp^2}{CH_2} = \overset{sp^2}{CH} - \overset{sp}{C} \equiv \overset{sp}{CH}$

157. (3)



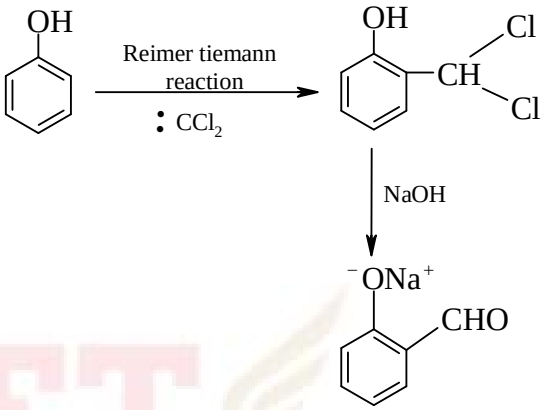
Intermolecular H-bonding

158. (1)



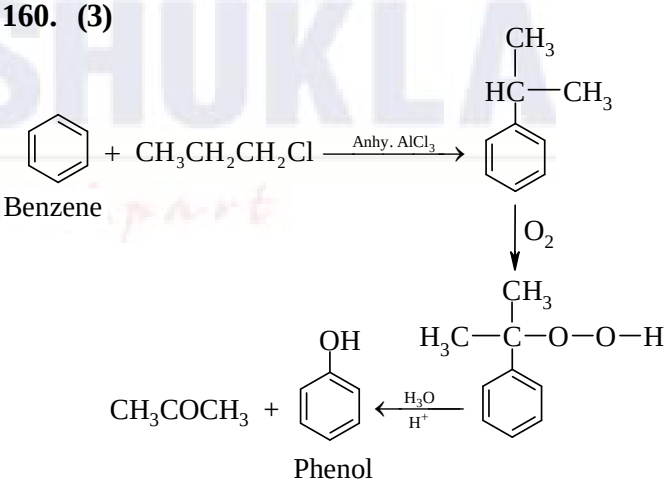
shows Idoform's test

159. (3)



Salicylaldehyde

160. (3)



Benzene Phenol

161. (3)

$NH_2 - CH_2 - COOH \rightleftharpoons NH_3^+ - CH_2 - COO^-$

Glycine Zwitterion

162. (3)

163. (1) B-does not have d-orbitals and $\therefore$ cannot expand its octet.

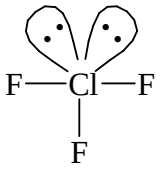
164. (2) HNO_3, NO, N_2, NH_4Cl

$\downarrow$ $\downarrow$ $\downarrow$ $\downarrow$

+5 +2 0 −3

165. (1, 2, 3, 4) All options are true

166. (4)



167. (1)

168. (4)

$$2MnO_4^- + 5C_2O_4^{2-} + 16H^+ \rightarrow 2Mn^{2+} + 10CO_2 + 8H_2O$$

$(Mn^{+7} \longrightarrow Mn^{2+}) \times 2$

$(2C^{3+} \longrightarrow 2C^{4+}) \times 5$

169. (3) $\frac{1}{2}X_2 + \frac{1}{2}Y_2 \longrightarrow XY;\ \Delta H = -200$

$\frac{1}{2}(x) + \frac{1}{2}\left(\frac{x}{2}\right) - x = -200$

$x = 800$

x = bond enthalpy

170. (3)

171. (2) Exothermic reactions favoured by low T
Reactions which occur with decrease in volume are favoured by high P

172. (4) $t_{1/2} = \frac{[A]_0}{2k}$, $t_{1/2} \propto [A]_0$

173. (2) Value of 'a' indicate magnitude of intermolecular forces which decides ease of liquefaction.
a $\Rightarrow$ $NH_3 > CO_2 > O_2 > H_2$

174. (3) $N_{mix} = \frac{N_2V_2 - N_1V_1}{V_1 + V_2}$

$= \frac{75 \times 0.2 - 25 \times 0.2}{100} = 0.1N$

$[H^+] = 10^{-1}$ M ; pH = 1

175. (1)

176. (2) $k_{sp} = S^2 = \left(\frac{2.42 \times 10^{-3}}{233}\right)^2$

$= 1.08 \times 10^{-10}$

177. (3) $Mg \longrightarrow Mg^{2+} + 2e^-$

$X + 3e^- \longrightarrow X^{3-}$

Formula = Mg_3X_2

178. (1) $\frac{d_{bcc}}{d_{fcc}} = \frac{Z_{bcc}}{(a_{bcc})^3}\frac{(a_{fcc})^3}{Z_{fcc}}$

$= \frac{2}{\left(\frac{4r}{\sqrt{3}}\right)^3} \times \frac{\left(\frac{4r}{\sqrt{2}}\right)^3}{4} = \frac{3\sqrt{3}}{4\sqrt{2}}$

179. (1) Hund's Rule

180. (4)

	Bond Order as per MOT
CN^+	2
NO	2.5
CN	2.5
CN^-	3.0