

**ANSWERS KEY**

RE-AIPMT - 2015(Code-D)

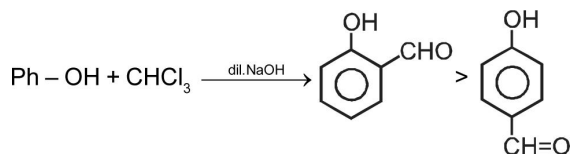
Date- 25-07-2015

1. (1)	24. (1)	47. (1)	70. (4)	93. (4)	116. (3)	139. (4)	162. (3)
2. (3)	25. (3)	48. (2)	71. (4)	94. (4)	117. (3)	140. (2)	163. (4)
3. (4)	26. (4)	49. (1)	72. (1)	95. (1)	118. (2)	141. (3)	164. (1)
4. (1)	27. (4)	50. (3*)	73. (1)	96. (4)	119. (1)	142. (4)	165. (4)
5. (2)	28. (4)	51. (4)	74. (3)	97. (4)	120. (2)	143. (1)	166. (4)
6. (1)	29. (4)	52. (1)	75. (1)	98. (1)	121. (1)	144. (4)	167. (4)
7. (1)	30. (2)	53. (1)	76. (3)	99. (1)	122. (1)	145. (1)	168. (3)
8. (2)	31. (2)	54. (3)	77. (4)	100. (3)	123. (1)	146. (2)	169. (4)
9. (4)	32. (2)	55. (2)	78. (3)	101. (1)	124. (1)	147. (4)	170. (1)
10. (2)	33. (1)	56. (4)	79. (1)	102. (1)	125. (3)	148. (4)	171. (1)
11. (1)	34. (3)	57. (2)	80. (2)	103. (4)	126. (4)	149. (1)	172. (1)
12. (4)	35. (3)	58. (2)	81. (2)	104. (3)	127. (2)	150. (4)	173. (3)
13. (4)	36. (2)	59. (3)	82. (1)	105. (2)	128. (4)	151. (3)	174. (3)
14. (1)	37. (3)	60. (4)	83. (4)	106. (4)	129. (1)	152. (1)	175. (4)
15. (1)	38. (3)	61. (4)	84. (1)	107. (3)	130. (2)	153. (4)	176. (4)
16. (4)	39. (2)	62. (1)	85. (1)	108. (2)	131. (2)	154. (2)	177. (4)
17. (1)	40. (1)	63. (4)	86. (4)	109. (2)	132. (2)	155. (3)	178. (1)
18. (1)	41. (3)	64. (3)	87. (2)	110. (1)	133. (4)	156. (4)	179. (2)
19. (3)	42. (2)	65. (3)	88. (1)	111. (4)	134. (3)	157. (1)	180. (1)
20. (1)	43. (3)	66. (2)	89. (3)	112. (1)	135. (3)	158. (1)	
21. (4)	44. (4)	67. (4)	90. (1)	113. (4)	136. (2)	159. (1)	
22. (4)	45. (4)	68. (1)	91. (4)	114. (1)	137. (4)	160. (3)	
23. (4)	46. (1)	69. (1)	92. (1)	115. (1)	138. (3)	161. (4)	

## RE-AIPMT-2015 Solution (Code-D)

## CHEMISTRY

91. (4)



It is Reimer - Tiemann reaction

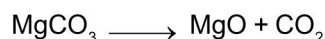
92. (1)

$$K = \frac{[\text{NO}]^2}{[\text{N}_2][\text{O}_2]}$$

$$K' = \frac{\text{NO}}{[\text{N}_2]^{1/2} [\text{O}_2]^{1/2}}$$

$$\therefore K' = \sqrt{K}$$

93. (4)



$$84 \text{ g} \qquad \qquad 40 \text{ g}$$

$$\therefore 8 \text{ g MgO will be from } \frac{84}{5} \text{ g}$$

$$\therefore \% \text{ Purity} = \frac{84}{5} \times \frac{100}{20} = 84\%$$

94. (4)

1 mole contains  $6.02 \times 10^{23}$  molecule

$$\therefore 18 \text{ mole will contain } 18 \times 6.02 \times 10^{23}$$

95. (1)

96. (4)

$$\text{Molality} = \frac{1000 \times n}{N \times M} \therefore 1 = \frac{1000 \times n}{N \times 18} = \frac{n}{N} = \frac{18}{1000}$$

$$\therefore \frac{n}{n+N} = \frac{18}{1018} = 0.0177$$

97. (4)

$$\text{It is zero order reaction } \therefore 6 \times 10^{-4} = \frac{\text{con.}}{20 \times 60}$$

$$\therefore \text{conc. of B} = 0.72 \text{ M}$$

98. (1)

$$\text{B.O. } \begin{matrix} \text{O}_2^+ & \text{O}_2 & \text{O}_2^- & \text{O}_2^{2-} \\ 2.5 & 2 & 1.5 & 1.0 \end{matrix}$$

99. (1)

In basic medium rate of hydrolysis increases with electron withdrawing group (-M effect predominates)

100. (3)

BeCO<sub>3</sub> to BaCO<sub>3</sub> stability increases

101. (1)

Strong acid with its salt can not form buffer solution.

102. (1)

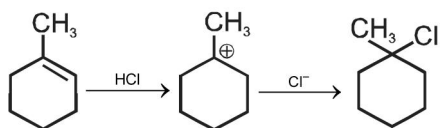
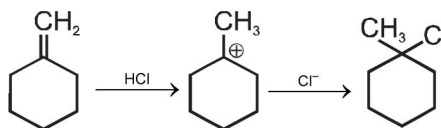
C.No. = 6

O.No. = +3

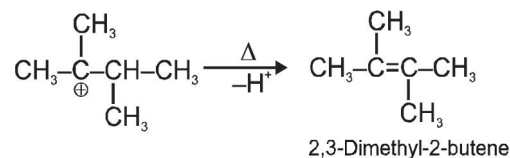
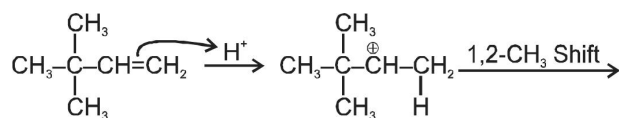
103. (4)

OF<sub>2</sub> is oxygen difluoride.

104. (3)



105. (2)



106. (4),

107. (3),

108. (2)

109. (2)

110. (1)

Lucas reagent in I & IV while S<sub>N</sub>1 in III

111. (4)

112. (1)

113. (4)

114. (1)

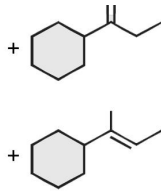
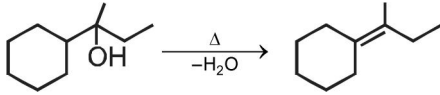
Caprolactum is used for the manufacturing of Nylon-6

115. (1)

116. (3)

117. (3)

118. (2)

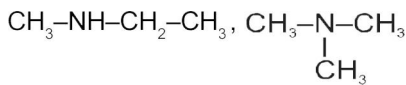
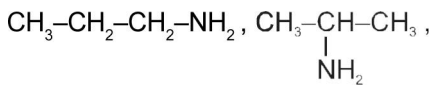


\* According to question (2) option is  
probable answer

119. (1)      120. (2)      121. (1)

122. (1)

123. (1)

Structure isomers of  $C_3H_9N$  are

Total = 4

124. (1)      125. (3)      126. (4)

127. (2)

Inversion product will be more than retention product due to close ion pair formation.

128. (4)      129. (1)      130. (2)

131. (2)

132. (2)

With Ammonia derivation carbonyl compounds give addition followed by elimination reaction. Slightly acidic medium will generate a nucleophilic centre for weak base like ammonia derivatives.

133. (4)

Chlorine of chlorobenzene is inert towards nucleophile, which is phthalimide ion.

134. (3)      135. (3)

## PHYSICS

136. (2)

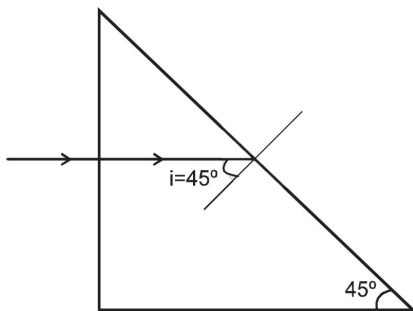
$$x = 45 \sin 2\pi t, \quad y = 4 \cos (2\pi t)$$

Squaring and adding  $x^2 + y^2 = 4^2 \Rightarrow R = 4$   
 $\Rightarrow$  Circular motion  
 $V = \omega R = (2\pi) (4) = 8\pi$   
 So, Ans. is (2)

137. (4)

E of x-ray      E (100 eV to 100 keV)

138. (3)



For TIR  $i > i_c$  so  $\sin i > \sin i_c$   
 $\sin 45^\circ > \frac{1}{\mu} \Rightarrow \mu > \sqrt{2} \Rightarrow \mu > 1.414$

Since  $\mu$  of green and violet are greater than 1.414 so they will total internal reflected. But red colour will be refracted  
 So Ans. is (3)

139. (4)

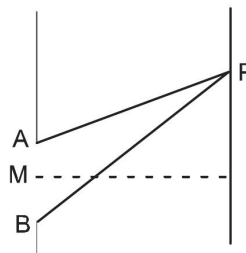


For collision  $\vec{V}_{B/A}$  should be along  $\vec{B} \rightarrow A$  ( $\vec{r}_{A/B}$ )

$$\text{So, } \frac{\vec{V}_2 - \vec{V}_1}{|V_2 - V_1|} = \frac{\vec{r}_1 - \vec{r}_2}{|r_1 - r_2|}$$

140. (2)

For first minima  
 $AP - BP = \lambda$



$$AP - MP = \frac{\lambda}{2}$$

$$\text{So phase difference} = \frac{2\pi}{\lambda} \times \frac{\lambda}{2} = \pi$$

141. (3)

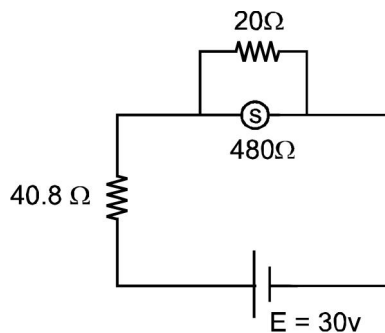
$$R = \frac{mV}{qB} = \frac{\sqrt{2m(kE)}}{qB}$$

Since R is same so  $KE \propto \frac{q^2}{m}$

So KE of  $\alpha$  particle will be  $\frac{(2)^2}{4} = \text{same} = 1 \text{ MeV}$

Ans. is (3)

142. (4)



$$\text{Resistance of ammeter} = \frac{480 \times 20}{480 + 20} = 19.2 \Omega$$

$$i = \frac{30}{40.8 + 19.2} = 0.5 \text{ A}$$

Ans. is (4)

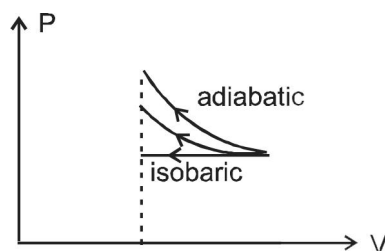
143. (1)

$$\rho = \rho_0(1 - \gamma\Delta t)$$

$$\frac{\Delta\rho}{\rho_0} = \gamma\Delta T = (5 \times 10^{-4})(40) = 0.02$$

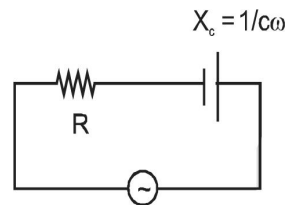
Ans. is (1)

144. (4)



Since area under the curve is max for adiabatic process so work done on the gas will be max for adiabatic process.

145. (1)



$$i = \frac{v}{\sqrt{R^2 + \left(\frac{1}{c\omega}\right)^2}}$$

$$V_c = \frac{v}{\sqrt{R^2 + \left(\frac{1}{c\omega}\right)^2}} \times \left(\frac{1}{c\omega}\right)$$

$$V_c = \frac{v}{\sqrt{(Rc\omega)^2 + 1}}$$

If we fill a di-electric material

$$C \uparrow \Rightarrow V_c \downarrow$$

Ans is (1)

146. (2)

$$KE_{\max} = \frac{hc}{\lambda} - \psi$$

$$KE_{\max} = \frac{1240}{500} - 2.82$$

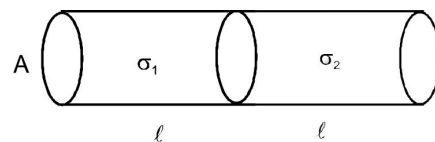
$$KE_{\max} = 2.48 - 2.28 = 0.2 \text{ eV}$$

$$\lambda_{\min} = \frac{h}{\sqrt{2m(KE_{\max})}} = \frac{\frac{20}{3} \times 10^{-34}}{\sqrt{2 \times 9 \times 10^{-31} \times 0.2 \times 1.6 \times 10^{-19}}}$$

$$\lambda_{\min} = \frac{25}{9} \times 10^{-9} = 2.80 \times 10^{-9} \text{ nm} \quad \text{so } \lambda \geq 2.8 \times 10^{-9} \text{ m}$$

Ans. (2)

147. (4)



$$R_{\text{ec}} = \frac{l}{\sigma_1 A} + \frac{l}{\sigma_2 A} = \frac{l_{\text{eq}}}{\sigma_{\text{eq}} A_{\text{eq}}}$$

$$\frac{2l}{\sigma_{\text{eq}} A} = \frac{l}{A} \left( \frac{\sigma_1 + \sigma_2}{\sigma_1 \sigma_2} \right)$$

$$\sigma_{\text{eq}} = \frac{2\sigma_1 \sigma_2}{\sigma_1 + \sigma_2}$$

Ans. (4)

148. (4)

$$\omega_i = \frac{15}{0.45} = \frac{100}{3} \quad \omega_f = 0$$

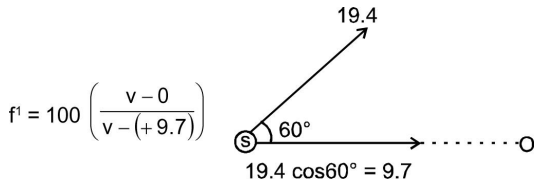
$$\omega_f = \omega_i + \alpha t$$

$$0 = \frac{100}{3} + (-\alpha)(15) \quad \alpha = \frac{100}{45}$$

$$\tau = (I)(\alpha) = 3 \times \frac{100}{45} = 6.66 \text{ N.m.}$$

149. (1)

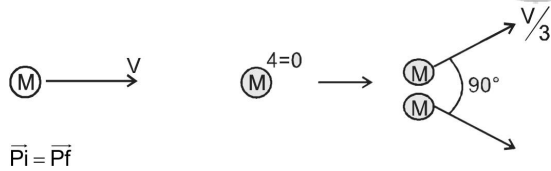
$$t' = f_0 \left( \frac{v-v}{v-v_s} \right)$$



$$f' = 100 \sqrt{\frac{v}{1 - \frac{9.7}{v}}}$$

$$f' = 100 \left( 1 + \frac{9.7}{330} \right) = 103 \text{ Hz}$$

150. (4)



$$\vec{P}_i = \vec{P}_f$$

$$\Rightarrow |\vec{P}_i| = |\vec{P}_f| \Rightarrow mV = \sqrt{\left(m\frac{V}{3}\right)^2 + (mV_2)^2}$$

$$V_2 = \frac{2\sqrt{2}}{3} V \quad \text{Ans.}$$

151. (3)

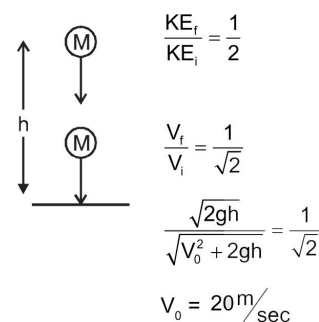
$$\text{K.E.} = \frac{1}{2} I \omega^2$$

I is min. about the centre of mass

$$\text{So. } (m_1)(x) = (m_2)(L-x)$$

$$x = \frac{m_2 L}{m_1 + m_2}$$

152. (1)



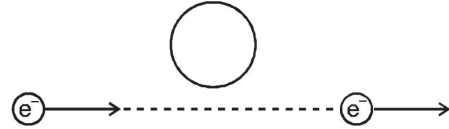
153. (4)

$$U \longrightarrow \text{Th} + \alpha$$

$$KE_{\text{Th}} = \frac{P^2}{2m_{\text{Th}}}, \quad KE_{\alpha} = \frac{P^2}{2m_{\alpha}}$$

since  $m_{\alpha}$  is less so  $KE_{\alpha}$  will be more

154. (2)



When  $e^-$  comes closer the induced current will be anticlockwise

When  $e^-$  comes farther induced current will be clockwise

155. (3)

$$\omega^2 A = \alpha$$

$$\omega A = \beta$$

$$\Rightarrow \omega = \frac{\alpha}{\beta}$$

$$\Rightarrow T = \frac{2\pi}{\omega} = \frac{2\pi\beta}{\alpha}$$

156. (4)

$$\frac{I_1}{I_2} = \frac{25}{1} \Rightarrow \frac{A_1}{A_2} = \frac{5}{1}$$

$$\frac{A_{\text{max}}}{A_{\text{min}}} = \frac{5+1}{5-1} = \frac{6}{4} = \frac{3}{2}$$

$$\frac{I_{\text{max}}}{I_{\text{min}}} = \left(\frac{3}{2}\right)^2 = \frac{9}{4}$$

157. (1)

$$V = 6xy - y + 24z$$

$$\vec{E} = \left( \frac{\partial V}{\partial x} \hat{i} + \frac{\partial V}{\partial y} \hat{j} + \frac{\partial V}{\partial z} \hat{k} \right)$$

$$\vec{E} = \left[ (6y) \hat{i} + (6x - 1 + 2z) \hat{j} + (2y) \hat{k} \right]$$

$$\vec{E} \Big|_{(1,1,0)} = -(6\hat{i} + 5\hat{j} + 2\hat{k})$$

158. (1)

Attraction between the plates

$$F = \frac{q^2}{2A\epsilon_0} \text{ where } q = CV \text{ and } C = \frac{\epsilon_0 A}{d}$$

$$F = \frac{C^2 V^2}{2Cd} = \frac{CV^2}{2d}$$

159. (1)

$$\mu_s = \tan 30^\circ = \frac{1}{\sqrt{3}} = 0.5$$

$$\mu_s = 0.57 = 0.6$$

$$S = ut + \frac{1}{2} a t^2$$

$$4 = \frac{1}{2} a(4)^2 \Rightarrow a = \frac{1}{2} = 0.5$$

$$a = g \sin \theta - \mu_k (g) \cos \theta$$

$$\Rightarrow \mu_k = \frac{0.9}{\sqrt{3}} = 0.5$$

160. (3)

$$\frac{1}{\lambda_1} = R_e \left( \frac{1}{1^2} - \frac{1}{2^2} \right)$$

$$\frac{1}{\lambda_2} = R_e \left( \frac{1}{2^2} - \frac{1}{3^2} \right)$$

$$\frac{\lambda_1}{\lambda_2} = \frac{5}{27}$$

161. (4)

$$\text{Current} = \frac{(3.5 - 0.5) \text{ A}}{100}$$

$$= \frac{3}{100} \text{ A} = 30 \text{ mA}$$

162. (3)

The gravitation force on the satellite will be aiming toward the centre of earth so acceleration of the satellite will also be aiming toward the centre of earth

163. (4)

If  $\vec{L}$  = constant then  $\vec{\tau} = 0$

so  $\vec{r} \times \vec{F} = 0 \Rightarrow \vec{F}$  should be parallel to  $\vec{r}$  so coefficient

should be in same ratio. So  $\frac{\alpha}{2} = \frac{3}{-6} = \frac{6}{-12}$

So  $\alpha = -1$  Ans (4)

164. (1)

$$K = \text{potential gradient} = \left( \frac{E_0 r}{r + r_1} \right) \frac{1}{L}$$

$$\text{so } E = K \ell = \frac{E_0 r \ell}{(r + r_1) L}$$

165. (4)

No. of mole of gas = 1 so molar mass = 4g/mole

$$V = \sqrt{\frac{\gamma RT}{m}} \Rightarrow 952 \times 952 = \frac{\gamma \times 3.3 \times 273}{4 \times 10^{-3}}$$

$$\Rightarrow \gamma = 1.6 = \frac{16}{10} = \frac{8}{5}$$

$$\gamma = \frac{C_p}{C_v} = \frac{8}{5} \quad \text{os } C_p = \frac{8 \times 5}{5} = 8 \text{ J K}^{-1} \text{ mole}^{-1}$$

166. (4)

$$F_c = \frac{mv_1^2}{r} = \frac{2mv_2^2}{(r/2)} = \frac{4mv_2^2}{r}$$

$$\text{so } v_1 = 2v_2$$

167. (4)

$$V_0 = \sqrt{\frac{GM}{r}} = \sqrt{\frac{GM}{R^2} \cdot \frac{R^2}{r}}$$

$$= \sqrt{\frac{9.8 \times 6.38 \times 6.38}{6.63 \times 10^6}} = \sqrt{60 \times 10^6} \text{ m/sec}$$

$$= 7.76 \text{ km/sec}$$

168. (3)

Fundamental frequency = highest common factor

$$= 105 \text{ Hz}$$

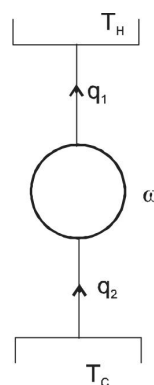
169. (4)

$$\text{cop} = \frac{q_1}{w} = \frac{q_2}{q_1 - q_2} = \frac{T_c}{T_H - T_c} = 5$$

$$T_c = 5T_H - 5T_c$$

$$6T_c = 5T_H$$

$$T_H = \frac{6}{5} \times 253 \text{ k} = 303.6 \text{ k} = 30.6^\circ \text{C} = 31^\circ \text{C}$$



170. (1)

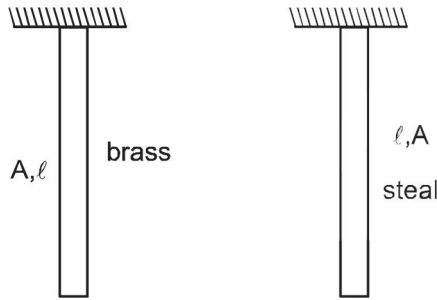
Water will not overflow but will change its radius of curvature.

171. (1)

$$P_A = \frac{\rho_A M_A}{RT}, \quad P_B = \frac{\rho_B M_B}{RT} = \frac{3}{2} \Rightarrow \frac{P_A}{P_B} = \frac{\rho_A M_A}{\rho_B M_B} = 2 \frac{M_A}{M_B} = \frac{3}{2}$$

$$\text{so, } \frac{M_A}{M_B} = \frac{3}{4}$$

172. (1)



$$Y = \frac{W}{A} \cdot \frac{l}{\Delta l}$$

$$\text{so } \Delta l = \frac{wl}{AY}$$

$$\Delta e_1 = \Delta e_2 \quad \frac{w_1 l}{AY_1} = \frac{w_2 l}{AY_2}$$

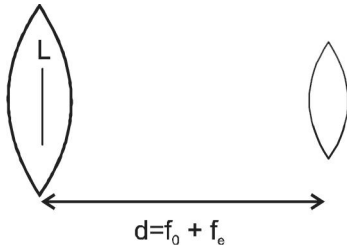
$$\frac{w_1}{w_2} = \frac{Y_1}{Y_2} = 2$$

173. (3)

CE amplifier causes phase difference of

$$\pi (= 180^\circ) \text{ so } V_{\text{out}} = 300 \cos \left( 15t + \frac{\pi}{3} + \pi \right)$$

174. (3)



Magnification by eyepiece

$$m = \frac{f}{f + u}$$

$$-\frac{I}{L} = \frac{f_e}{f_e + (-(f_o + f_e))} \Rightarrow \frac{I}{L} = \frac{f_e}{f_o}$$

$$m.p. = \frac{f_o}{f_e} = \frac{L}{I}$$

175. (4)

$$\text{power} = \vec{F} \cdot \vec{V} = PA\vec{V} = \rho ghAV$$

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

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

176. (4)

$$V_c = \eta^x \rho^y r^z$$

$$\text{critical velocity is given by } V_c = \frac{R\eta}{2\rho r}$$

$$\text{so, } x = 1$$

$$y = -1$$

$$z = -1$$

177. (4)

$$k_1 = \frac{hc}{\lambda} - \psi$$

$$k_2 = 3k_1 = \frac{2hc}{\lambda} - \psi = \frac{3hc}{\lambda} - 3\psi$$

$$\text{so } 2\psi = \frac{hc}{\lambda}$$

$$\text{so } \psi = \frac{hc}{2\lambda}$$

178. (1)

Volume inflow rate = volume anflow rate

$$\pi R^2 V = n\pi r^2 (v) \Rightarrow v = \frac{\pi R^2 V}{n\pi r^2} = \frac{VR^2}{nr^2}$$

179. (2)

$$\vec{A} = \cos wt \hat{i} + \sin wt \hat{j}$$

$$\vec{B} = \cos \frac{wt}{2} \hat{i} + \sin \frac{wt}{2} \hat{j}$$

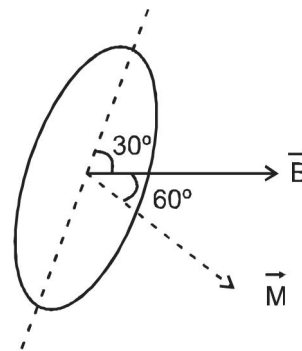
$$\text{for } \vec{A} \cdot \vec{B} = 0$$

$$\vec{A} \cdot \vec{B} = 0 = \cos wt \cdot \cos \frac{wt}{2} + \sin wt \cdot \sin \frac{wt}{2}$$

$$= \cos \left( wt - \frac{wt}{2} \right) = \cos \left( \frac{wt}{2} \right)$$

$$\text{so } \frac{wt}{2} = \frac{\pi}{2} \Rightarrow t = \frac{\pi}{w}$$

180. (1)



$$\vec{\tau} = \vec{M} \times \vec{B} = MB \sin 60^\circ$$

$$= Ni AB \sin 60^\circ$$

$$= 50 \times 2 \times 0.12 \times 0.1 \times 0.2 \times \frac{\sqrt{3}}{2}$$

$$= 12\sqrt{3} \times 10^{-2} \text{ Nm} = 0.20784 \text{ Nm}$$

