EENADU MODEL EAMCET

MEDICAL KEY (Revised)

BOTANY

1-add score; 2-3; 3-2; 4-3; 5-3; 6-2; 7-4; 8-4; 9-2 or 3; 10-2; 11-add score; 12-4; 13-2; 14-3; 15-3; 16-1; 17-1; 18-1; 19-2; 20-3; 21-4; 22-2; 23-1; 24-4; 25-3; 26-4; 27-1; 28-add score; 29-4; 30-2; 31-2; 32-2; 33-3; 34-4; 35-4; 36-2; 37-3; 38-3; 39-1; 40-3.

ZOOLOGY

41-4; 42-3; 43-3; 44-2; 45-4; 46-2; 47-1; 48-4; 49-4; 50-2; 51-4; 52-1; 53-1; 54-1; 55-1; 56-3; 57-4; 58-4; 59-3; 60-3; 61-4; 62-1; 63-3; 64-2; 65-1; 66-1; 67-4; 68-4; 69-3; 70-2; 71-3; 72-2; 73-2; 74-1; 75-4; 76-1; 77-4; 78-3; 79-1; 80-1.

PHYSICS

81-1; 82-3; 83-4; 84-2; 85-1; 86-1; 87-3; 88-1; 89-1; 90-3; 91-4; 92-3; 93-2; 94-3; 95-2; 96-1; 97-2; 98-4; 99-3; 100-3; 101-1; 102-2; 103-2; 104-3; 105-2; 106-3; 107-4; 108-2; 109-3; 110-4; 111-1; 112-1; 113-4; 114-4; 115-3; 116-2; 117-3; 118-3; 119-3; 120-4.

CHEMISTRY

121-3; 122-4; 123-2; 124-3; 125-3; 126-4; 127-2; 128-3; 129-1; 130-4; 131-1; 132-2; 133-2; 134-3; 135-3; 136-1; 137-3; 138-2; 139-4; 140-2; 141-3; 142-2; 143-4; 144-4; 145-4; 146-4; 147-3; 148-3; 149-1; 150-2; 151-1; 152-2; 153-4; 154-3; 155-4; 156-2; 157-1; 158-2; 159-1; 160-2.

EENADU MODEL EAMCET

MEDICAL SOLUTIONS

PHYSICS

81. $\frac{AB}{CD} = \frac{F}{T^{-1}L^{-1}} = \frac{MLT^{-2}}{L^{-1}T^{-1}} = ML^2T^{-1}$

82. $y = u \sin\theta\,(t) - \frac{1}{2}gt^2$

$u\left(\frac{1}{2}\right)1 - \frac{1}{2}(10)\,1 = u\left(\frac{1}{2}\right)3 - \frac{1}{2} \times 10 \times 9$

$\frac{u}{2} - 5 = \frac{3u}{2} - 45$ or $u = 40$

83. Horizontal velocity $= V_R - V_B \sin 37° = 4 - 5\left(\frac{3}{5}\right) = 1$

$t = \frac{D}{V_B \cos 37} = \frac{1000}{5\left(\frac{4}{5}\right)} = 250$

Drift = (Horizontal velocity)t = 250 m

84. $\overline{P}_3 = -(\overline{P}_1 + \overline{P}_2) = -(1 \times 2\hat{i} + 1 \times 3\hat{j})$

Force $= \frac{\overline{P}_3}{\text{Time}} = \frac{-(2i + 3j)}{10^{-5}} = -(2i + 3j)10^5$

85. (i) PE = 1x

KE = 1x

E = 2x

(ii) E' = 8x

PE' = 1x

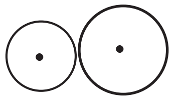
KE' = 7x

86. $12 = f_{ms} = \mu_s m_u g \Rightarrow \mu_s = \frac{12}{4g}$

$F = \mu_s(m_u + m_B)g = \frac{12}{4g}(12g) = 36$ N

R-8-4-16

87. $m \propto (\text{Radius})^3$



$m_1 = R^3,\ m_2 = 8R^3$

$$x_c = \frac{m_1x_1 + m_2x_2}{m_1 + m_2} = \frac{R^3(-R) + 8R^3(2R)}{9R^3}$$

$$= \frac{-R + 16\,R}{9} = \frac{15\,R}{9} = \frac{5\,R}{3}$$

88. $I = \dfrac{ml^2}{3}$

$I' = \dfrac{mr^2}{2}$

$l = 2\pi r \Rightarrow r = \dfrac{l}{2\pi}$

$I' = \dfrac{m}{2}\,\dfrac{l^2}{4\pi^2} = \dfrac{3I}{8\pi^2}$

89. Centrifugal force acts outwards and car overturns outwards.

90. $E_n = \dfrac{-GMm}{2r_n}$

$E_2 = \dfrac{-GMm}{2(2R)} = \dfrac{-GMm}{4\,R}$

$E_3 = \dfrac{-GMm}{2(3R)} = \dfrac{-GMm}{6\,R}$

$$\Delta E = E_3 - E_2 = \frac{-GMm}{6\,R} + \frac{GMm}{4\,R} = \frac{-2GMm + 3GMm}{12\,R} = \frac{GMm}{12\,R}$$

91. T_{Max} = T at mean position $= mg + \dfrac{mv^2}{r}$

$= mg + \dfrac{m}{r}[2gr(1 - \cos\theta)]$

$= mg + 2\,mg - 2\,mg\cos 60^\circ = 2\,mg$

T_{Min} = T at extreme $= mg\cos\theta = \dfrac{mg}{2}$

$\dfrac{T_{Max}}{T_{Min}} = 4$

93. $2\pi(r_2 + r_1)T = mgh = \pi(r_2^2 - r_1^2)gh$

$$= \pi(r_2 + r_1)(r_2 - r_1)gh$$

$$h = \frac{2T}{(r_2 - r_1)g} = \frac{2 \times 75 \times 10^{-3}}{1 \times 10^{-3} \times 10} = 15 \text{ mm}$$

94. $V_B d_B = V_l d_l$

(i) $V_B d_B = \left(\frac{\alpha}{\beta}\right) V_B d_w$ .... (1)

(ii) $V_B d_B = \left(1 - \frac{\alpha}{\beta}\right) V_B d_l = \left(\frac{\beta - \alpha}{\beta}\right) V_B d_l$

$$\therefore \left(\frac{\beta - \alpha}{\beta}\right) V_B d_l = \left(\frac{\alpha}{\beta}\right) V_B d_w$$

$$\frac{d_l}{d_B} = \frac{\alpha}{\beta - \alpha}$$

95. $\Delta T = \frac{1}{2}\alpha(\Delta t)(86{,}400)$

$$\Delta t = \frac{\Delta T}{\frac{1}{2}\alpha(86{,}400)} = \frac{17.28}{\frac{1}{2} \times 2 \times 10^{-5} \times 8.64 \times 10^4}$$

or $t_2 - t_1 = 20°C$

$$t_2 = t_1 + 20° \text{ C} = 30° \text{ C}$$

96. $PV = nRT$ or $V = \frac{nRT}{P}$

$$VT = \left(\frac{nRT}{P}\right)T = \frac{nRT^2}{P} = \text{Constant}$$

or $\frac{T_1^2}{P_1} = \frac{T_2^2}{P_2}$ or $P_2 = P_1\left(\frac{T_2}{T_1}\right)^2 = P(2)^2 = 4P$

97. $C_p - C_v = C_p - \frac{C_p}{r} = C_p\left(1 - \frac{1}{r}\right) = C_p\left(\frac{r-1}{r}\right) = 600$

$$C_p = 600\left(\frac{r}{r-1}\right) = 600\left(\frac{1.6}{0.6}\right) = 1600$$

98. $U = U_{Oxygen} + U_{Argon}$

$$= 2\left[5\left(\frac{1}{2}RT\right)\right] + 4\left[3 \times \frac{1}{2}RT\right] = 11\text{ RT}$$

99. $\Delta Q = \Delta U + \Delta W$

In adiabatic, $\Delta Q = 0$

$\therefore \Delta U = -\Delta W$

100. $K_pA_p = K_1A_1 + K_2 A_2$

$K_p 4\pi r^2 = K_1\pi r^2 + K_2(\pi)[(2r)^2 - (r)^2]$

$K_p 4\pi r^2 = K_1\pi r^2 + K_2 \pi 3r^2$

$$K_p = \frac{K_1 + 3K_2}{4}$$

101. $K = \frac{2\pi}{\lambda} = \frac{\pi}{10}$

$\therefore \frac{\lambda}{2} = 10$

Here $l = 3\frac{\lambda}{2} = 30$ cm

102. Difference between successive = 170 Hz

For open pipe, difference = (Integral multiple) × Fundamental

For closed pipe, difference = 2 × Integral multiple × Fundamental

Here difference = 2 × 85

So pipe is closed pipe of fundamental 85

$n_c = \frac{v}{4l}$

$\therefore l = \frac{v}{4n_c} = \frac{340}{4 \times 85} = 1$

103. $\Delta n = \frac{2nv_s}{v}$

$\frac{\Delta n_1}{\Delta n_2} = \frac{n}{n + 100} = \frac{6}{8}$

$4n = 3n + 300$ or $n = 300$

104. $i_1 + i_2 = A + d$

$60° + i_2 = 45° + 15°$

$\therefore i_2 = 0$ and $r_2 = 0$

Then $r_1 = A = 45°$

$$\mu = \frac{\sin i_1}{\sin r_1} = \frac{\sin 60°}{\sin 45°} = \frac{\sqrt{3}}{2} \times \frac{\sqrt{2}}{1} = \sqrt{\frac{3}{2}}$$

105. $u_e = f_e = 3$

$v_0 + u_e = L = 15$ cm

$\therefore v_0 = 12$ cm

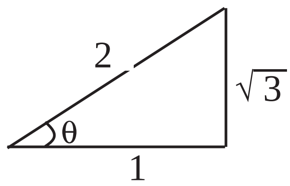
$$\frac{1}{v_0} - \frac{1}{u_o} = \frac{1}{f_0}$$

$$\frac{1}{12} - \frac{1}{u_0} = \frac{1}{2}$$

$$\frac{1}{u_0} = \frac{1}{12} - \frac{1}{2} = \frac{1-6}{12} = \frac{-5}{12} = \frac{-1}{2.4}$$

106. Path difference = $S_1N = d\cos\theta$

$$\cos\theta = \frac{S_1N}{d} = \frac{1\lambda}{2\lambda} = \frac{1}{2}$$



$y = D \operatorname{Tan}\theta$

$= D(\sqrt{3})$

107. $\mu = \dfrac{v_{air}}{v_{med}} = \dfrac{\lambda_a}{\lambda_m}$

aslo $\mu = \tan\theta_p = \tan\theta$

$$\therefore \frac{\lambda_a}{\lambda_m} = \tan\theta \text{ or } \lambda_m = \frac{\lambda_a}{\tan\theta} = \lambda_a \cot\theta$$

108. $dv = -\overline{E}.\overline{dr} = -(20i + 30j).(2i + 3j)$

$v - v_0 = -(40 + 90) = -130$

$v = v_0 - 130 = 30 - 130 = -100$ volt

109. (i) $\dfrac{1}{2}CV^2 = u$

$$\therefore \frac{1}{2}\left(3 \times 10^{-16}\right)V^2 = 600 \times 10^{-6}$$

$\therefore\ V^2 = \dfrac{600 \times 10^{-6} \times 2}{3 \times 10^{-6}} = 400$

For each capacitor V = 20 Volt

$\therefore$ Total P.D. = 60 Volt

In series $\dfrac{V_1}{V_2} = \dfrac{C_2}{C_1} = \dfrac{6}{2} = \dfrac{3}{1}$

$\therefore\ V_1 = 60 \text{ Volt} \times \dfrac{3}{4}$

110. Current circulates in each closed path and no current flows through 2 Ω.

111. $\dfrac{P}{Q} = \dfrac{l_1}{100 - l_1}$

Balancing length independent of direction of current

112. $\dfrac{M_1}{M_2} = \left(\dfrac{d_1}{d_2}\right)^3 = \dfrac{0.8}{2.7} = \dfrac{8}{27} = \left(\dfrac{2}{3}\right)^3$

$\dfrac{d_1}{d_2} = \dfrac{2}{3}$

Inside: $\dfrac{d_1}{40 - d_1} = \dfrac{2}{3}$

$\therefore\ 3d_1 = 80 - 2d_1$

$d_1 = 16 \text{ cm}$

Outside: $\dfrac{d_1}{40 + d_1} = \dfrac{2}{3}$

$\therefore\ 3d_1 = 80 + 2d_1$

113. $Z = \sqrt{R^2 + (X_L \sim X_C)^2} = \sqrt{10^2 + 10^2} = 10\sqrt{2}$ ohm

$i_{rms} = \dfrac{E_{rms}}{Z} = \dfrac{200\sqrt{2}}{10\sqrt{2}} = 20 \text{ A}$

114. $i_g = 4 \times 10^{-4} \times 25 = 10^{-2}$

$R = \dfrac{V}{i_g} - G = \dfrac{25}{10^{-2}} - 50$

117. Due to downward electric field, K.E. of each electron moving upwards increases. Then stopping potential will increase.

118. $T_{1/2} = (T_{Mean})(0.693)$

$T_{1/2}$ of Y is less. So activity of Y is more.

119. $h\upsilon_1 = h\upsilon_2 + h\upsilon_3$

$$\frac{hc}{\lambda_1} = \frac{hc}{\lambda_2} + \frac{hc}{\lambda_3}$$

120. Pressure = pre.due to absorption + pre.due to reflection

$$= \frac{I_1}{C} + \frac{2I_2}{C}$$

$$= \frac{3 \times 10^3}{3 \times 10^8} + \frac{2 \times 1 \times 10^3}{3 \times 10^8} = \frac{5}{3} \times 10^{-5}$$

CHEMISTRY

121. $E = \frac{hc}{\lambda}$; $E_{photon} = \frac{12400 \text{ eV A}^\circ}{3100 \text{ A}^\circ} = 4 \text{ eV}$

$E = E^\circ + E_k = E^\circ + \frac{1}{2} mv^2$; $\frac{1}{2} mv^2 = E - E^\circ$

$v \propto \sqrt{E - E^\circ}$; $E - E^\circ$ is the least for Mg 4.0 – 3.7 = 0.3 eV.

122. r, v, E are related to nuclear charge, angular momentum is not.

123. Al_2O_3 reacts both with acids and bases.

124. ICl_3 I atom possesses 10 valence electrons.

126. Boron hydrides are covalent, not ionic.

133. IF_7 is pentagonal bipyramidal. $\% I = \frac{127 \times 100}{260} \simeq 49.$

135. In acid medium MnO_4^{2-} disproportionates into MnO_4^- and MnO_2

$3 MnO_4^{2-} + 4 H^+ \longrightarrow 2 MnO_4^- + MnO_2 + 2 H_2O$

141. $2 NaHCO_3(s) \xrightarrow{\text{heat}} Na_2CO_3(s) + H_2O \uparrow + CO_2 \uparrow$

$MgCO_3(s) \xrightarrow{\text{heat}} MgO(s) + CO_2 \uparrow$

Loss in weight = Weight of CO_2 + Weight of H_2O = 9.05 g

$NaHCO_3 + HCl_{(aq)} \longrightarrow NaCl_{(aq)} + H_2O_{(l)} + CO_2(g)$

$MgCO_3 + 2 HCl_{(aq)} \longrightarrow MgCl_2(aq) + H_2O_{(l)} + CO_2(g)$

Volume of gas = Volume of CO_2

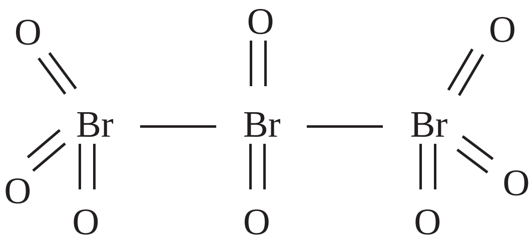
= $3.92 \text{ L}_{\text{at } 0^\circ\text{C \& 1 atm}}$

Weight of $CO_2 = \frac{3.92 \times 44}{22.4} = 7.7$ g

Weight of H_2O = 9.05 – 7.7 = 1.35 g

Weight of $NaHCO_3 = \frac{1.35 \times 168}{18} = 12.6$ g

$\% NaHCO_3 = \frac{12.6 \times 100}{21} = 60$

142. 

+6 +4 +6

143. $r \propto \frac{1}{\sqrt{M}}$; $r_A : r_B : r_C = 1 : 2 : 4$

$\therefore M_A : M_B : M_C = 16 : 4 : 1$

$M_{SO_2} : M_{CH_4} : M_{He} = 64 : 16 : 4 = 16 : 4 : 1$

144. O_2(g) and Xe(g) gases mix up into homogeneous and hence cannot be colloid.

145. a = edge length, r = radius of atom; simple cube a = 2r.

Body centre $\sqrt{3}\,a = 4r$; face centre $\sqrt{2}\,a = 4r$

$a_A : a_B : a_C = 2 : \frac{4}{\sqrt{3}} : \frac{4}{\sqrt{2}}$ Hence $a_A < a_B < a_C$

146. $\Delta T_b \propto$ concentration of particles

Particles' concentration (1) Urea = 0.1×1 (2) NaC*l* = $0.1 \times 2 = 0.2$

(3) $BaCl_2 = 0.01 \times 3 = 0.03$ (4) $K_4\left[Fe(CN)_6\right] = 0.004 \times 5 = 0.02$

147. $\Delta G = \Delta H - T\Delta S$ if $-$ve spontaneous

$= -35000\ J - T(-50\ J)$

$= -35000\ J + 50T\ J$

ΔG is $-$ve if T is less than 700

(1) 427 + 273 = 700 K

(2) 800 + 273 = 1073 K

(3) 200 + 273 = 473 K

(4) 800 K

148. $N_2(g) + 3\,H_2(g) \rightleftharpoons 2\,NH_3$; $K_c = \frac{[NH_3]^2}{[N_2]\,[H_2]^3} = x$

$NH_3(g) \rightleftharpoons \frac{1}{2}\,N_2(g) + \frac{3}{2}\,H_2(g)$; $K'_c = \frac{[N_2]^{1/2}\,[H_2]^{3/2}}{[NH_3]} = \frac{1}{x^{1/2}} = x^{-1/2}$

149. The smaller the pKa, the stronger would be the acid.

150. $log \frac{K_2}{K_1} = \frac{E_a}{2.303\ R}\left[\frac{T_2 - T_1}{T_1 T_2}\right]$; $E_a = log \frac{0.2}{0.02} \times 2.303 \times R \times \frac{800 \times 400}{800 - 400}$

$= 1 \times 2.303 \times R \times 800$

$= 1842.4\ R$

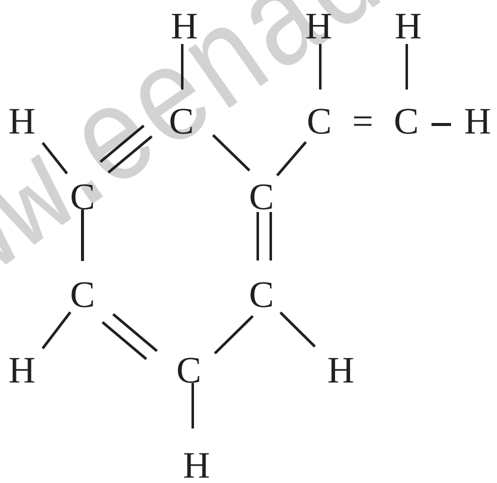
Cell reaction: $2\ Ag_{(s)} + Cl_{2(g)} \longrightarrow 2\ Ag^{+}_{(aq)} + 2\ Cl^{-}_{(aq)}$

151. $E_{cell} = \left[E^{\circ}_{cathode} - E^{\circ}_{anode}\right] - \frac{0.06}{n}\ log\ \frac{[Product]}{[Reactant]}$

$E_{cell} = [1.4 - (+0.8)] - \frac{0.06}{2}\ log \left(10^{-1}\right)^2 \times \left(10^{-3}\right)^2$

$= 0.60 - \frac{0.06}{2} \times 8 = 0.60 + 24 = 0.84\ V$

153.



$n_\sigma = 16,\ n_\pi = 4$

ratio of $n_\sigma : n_\pi = 16 : 4 = 4 : 1$

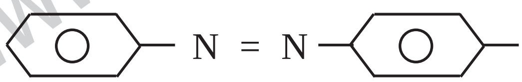
154. In Kjeldahl's method % N $= \frac{\left(V_{mL} \times M \times Valency\right)_{acid} \times 100 \times 14}{1000 \times W_{org\ compound}}$

$= \frac{10 \times 1 \times 2 \times 100 \times 14}{1000 \times 0.5} = 56$

157. Phenol is less acidic than p–nitrophenol.

158. Only an aldehyde having no α–hydrogen takes part is Cannizzaro reaction.

159. Among carboxylic acids trifluoro acetic acid is the strongest.

160. 

is orange coloured dye.