PACE-IIT & MEDICAL

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MOCK TEST - 3 -(NEET 2018 Aspirants) - Solutions

(1) $$\frac{\Delta P}{P} \times 100 = \left(3 \cdot \frac{\Delta a}{a} + 2\frac{\Delta b}{b} + \frac{\Delta c}{c} + \frac{\Delta d}{d}\right) 100$$

$$= 3.1 + 2.2 + 3 + 4$$

$$= 14\%$$

(3) $S = ut + \frac{1}{2}at^2$

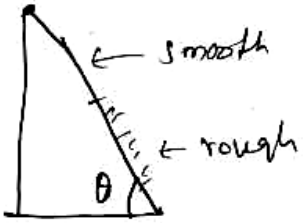
$h_1 = +0 + \frac{1}{2} g(5)^2$

$h_1 + h_2 = \frac{1}{2} g (10)^2$

$h_1 + h_2 + h_3 = \frac{1}{2} g (15)^2$

(4) block is moving with const. speed, so net force will be zero.

(5)



$v^2 = u^2 + 2as$

$v^2 = 0 + 2(g\sin\theta) \cdot s$ —— (1)

$0 = v^2 - 2\left[\mu g\cos\theta - g\sin\theta\right] s$ —— (2)

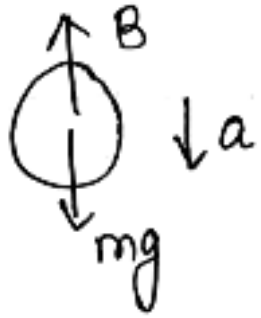
from (1) & (2)

$2(g\sin\theta)s = 2\left[\mu g\cos\theta - g\sin\theta\right] s$

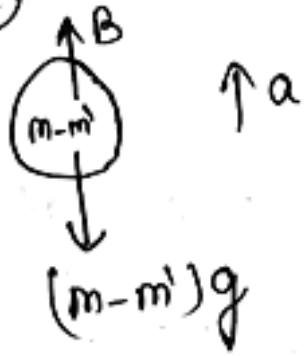
$\mu = 2\tan\theta$

(6)

$$mg - B = ma \quad \text{—— (1)}$$



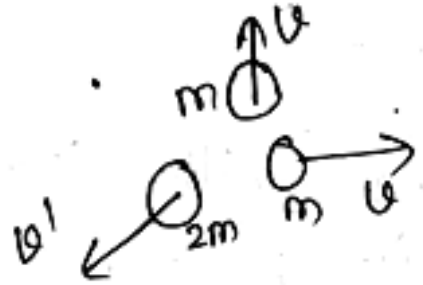
$$B - (m-m')g = (m-m')a \quad \text{—— (2)}$$



from (1) & (2)

$$m' = \frac{2ma}{g+a}$$

(7)



from momentum Cons. –

$$v' = \frac{v}{\sqrt{2}}$$

$$K.E = \frac{1}{2}mv^2 + \frac{1}{2}mv^2 + \frac{1}{2}(m)\frac{v^2}{2}$$

$$= \frac{3}{2}mv^2$$

(8) $a = -\omega^2 A \cos\omega t$

(9)

$$T \cdot R = I\alpha$$

$$\Rightarrow T R = \frac{MR^2}{2} \cdot \alpha$$

$$\Rightarrow T = \frac{(50)(0.5)}{2}(2) = 25\ N$$

(10) for pure rolling

$$a = \left(g\sin\theta - \frac{f}{m}\right)$$

$$f \cdot R = I\alpha$$

$$\Rightarrow f = \frac{2}{5} M(R\alpha)$$

$$\Rightarrow f = \frac{2}{5} \cdot Ma$$

$$a = g\sin\theta - \frac{2}{5} a$$

$$\boxed{a = \frac{5}{7} g\sin\theta}$$

for smooth incline –

$$a = g\sin\theta$$

(11)

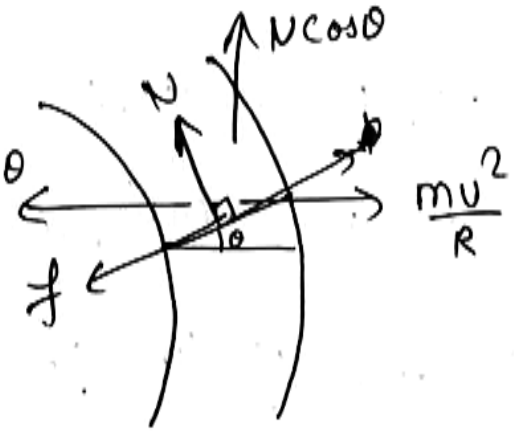
$$\frac{1}{\lambda} = RZ^2\left[\frac{1}{n_1^2} - \frac{1}{n_2^2}\right]$$

$$= 10^7 \cdot (1)^2\left[\frac{1}{4} - \frac{1}{\infty}\right]$$

(12)

$$v_e \propto \sqrt{\frac{M}{R^2}} \quad \propto \sqrt{\frac{R^3\rho}{R}}$$

(14)



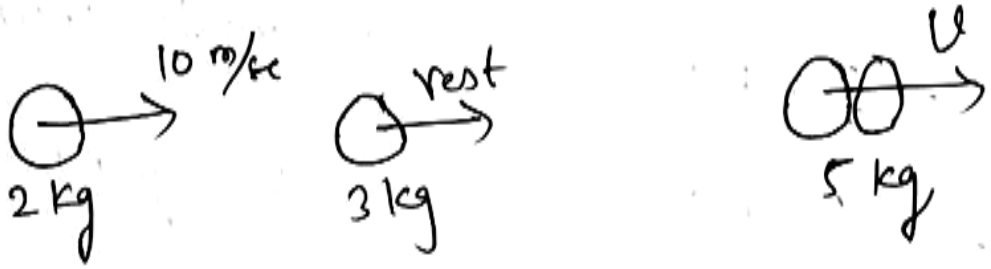
for maximum safe speed friction would be inward.

$$f\cos\theta + N\sin\theta = \frac{mv^2}{R} \quad \text{—— (1)}$$

$$N\cos\theta = f\sin\theta + mg \quad \text{—— (2)}$$

$$f = \mu N \quad \text{—— (3)}$$

(16)



$$10\cdot(2) + 0 = 5v$$

$$v = 4 \text{ m/sec}$$

$$\text{loss} = K_i - K_f$$

$$= \frac{1}{2}\cdot 2(10)^2 - \frac{1}{2}\cdot(5)(4)^2$$

$$= 60 \text{ J}$$

(20) $E = \frac{1}{2} m\omega^2 A^2$

$= \frac{1}{2} m(2\pi\eta)^2 \cdot A^2$

(21) loss in P.E = gain in K.E

$mg(80) = \frac{1}{2} mv^2$

(23) $f \geq \frac{1}{RC}$

(24) $E = \frac{12400}{\lambda}$, λ in Å & E in eV

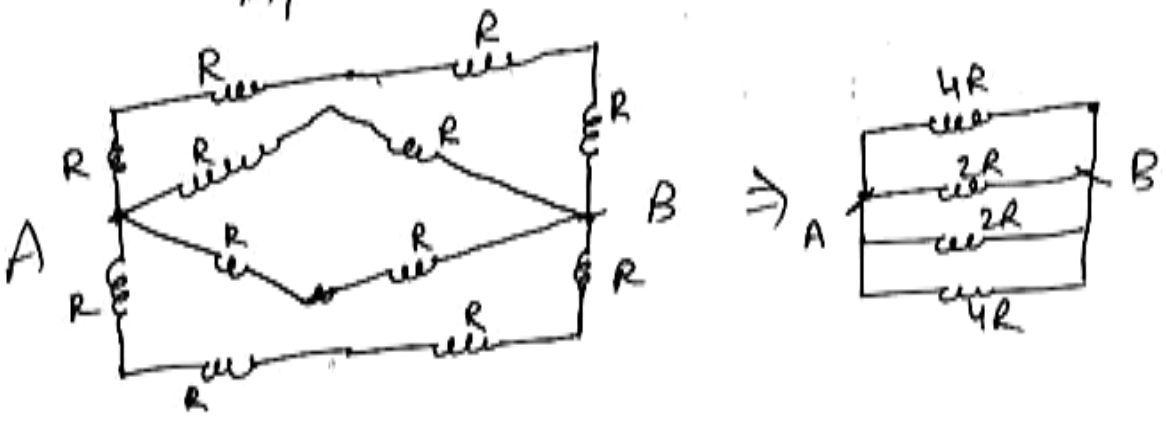
(26) $F = v \cdot \frac{dm}{dt}$

$F = ma$

(28) $\Delta E = \frac{1}{2} k x_f^2 - \frac{1}{2} k x_i^2$

(30) $\Delta l = \frac{Fl}{AY}$

(33)



(36) $\Delta T = \frac{1}{2}\alpha \Delta\theta T$

(37) $C_{V_{max}} = \frac{C_{V_1} + C_{V_2}}{2}$

(38) $\Delta Q = W + \Delta U$

$840 = 40 + \Delta U$

(39) $H = \frac{KA\Delta\theta}{\ell}$, $H \propto \frac{r^2}{\ell}$

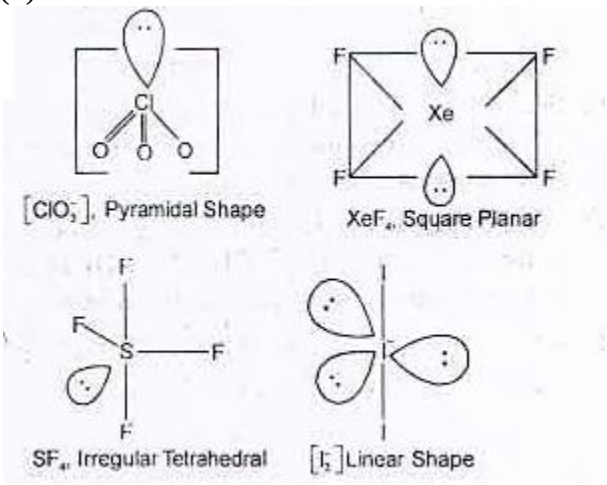
(42) $\frac{kq_1q_2}{r^2} = \frac{mv^2}{r}$

$\Rightarrow v = \frac{kq_1q_2}{mvr} = \frac{kq_1q_2(2\pi)}{nh}$

(43) $R \propto A^{1/3}$

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

46. (4)



47. (4)

Order of a reaction can be fraction or zero or complete positive and negative number.

48. (2)

Equimolar amounts of NO and NO_2 gases at – 30°C give N_2O_3 which is a blue liquid

$$NO_{(g)} + NO_{2(g)} \xrightarrow{-30^\circ C} \underset{\text{blue}}{N_2O_{3(l)}}$$

49. (3)

Ore	Chemical Composition
Cuprite	Cu_2O
Chalcocite	Cu_2S
Chalcopyrite	$CuFeS_2$
Malachite	$Cu(OH)_2.CuCO_3$

50. (2)

All silicates have tetrahedral SiO_4^{4-} ion, as a basic building unit i.e. all silicates are composed of many units. Tetrahedral shape of $[SiO_4]^{4-}$ ion is due to sp^3-hybridisation of Si-atom. Sheet Silicates are formed when three oxygen atoms (bridging O-atoms) of each $(SiO_4)^{4-}$ unit are shared.

51. (2)

Colour of transition metal ion salt is due to d-d transition of unpaired electrons of d-orbital. Metal ion salt having similar number of unpaired electrons in d-orbitals show similar colour in aqueous medium. In $VOCl_2$, Vanadium is present as V^{4+} and in $CuCl_2$, copper is present as Cu^{2+}.

V^{4+} : $1s^2\ 2s^2\ 2p^6\ 3s^2\ 3p^6\ 3d^1$: 1 unpaired e^-

Cu^{2+} : $1s^2\ 2s^2\ 2p^6\ 3s^2\ 3p^6\ 3d^9$: 1 unpaired e^-

Hence, $VOCl_2$ and $CuCl_2$ show similar colour.

52. (1)

Number of radial nodes = $(n - l - 1)$

For $3s$, $n = 3$, $l = 0$

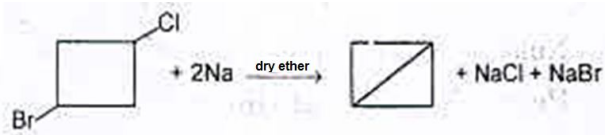
Number of radial node = $3 - 0 - 1 = 2$

For $2p$, $n = 2$, $l = 1$

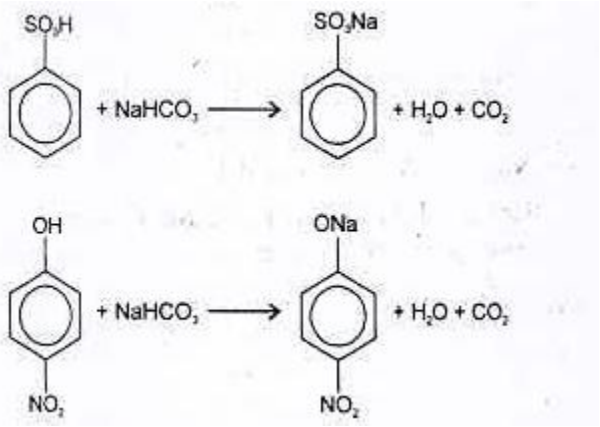
Number of radial node = $2 - 1 - 1 = 0$

53. (2)

54. (4)



55. (4)



56. (1)

Molar heat capacity for any process is given as

$C = C_v + \frac{R}{1-\gamma}$ when PV^γ = constant and $C_p/C_v = \gamma$

$\frac{P}{V} = 1$ i.e. PV^{-1} = constant

$C = \frac{3}{2}R + \frac{R}{(1-(-1))}$

$= \frac{3}{2}R + \frac{R}{2} = \frac{4}{2}R$

57. (2)

Orbital angular momentum = $\frac{h}{2\pi}\sqrt{l(l+1)}$

For $3s$ electron, $l = 0$

$\therefore$ Orbital angular monentum = $\frac{h}{2\pi}\sqrt{0(0+1)}$

$= 0$

58. (4)

$$\Delta E = h\nu = \frac{hc}{\lambda}$$

$$\lambda = \frac{hc}{\Delta E} = \frac{6.62\times10^{-34}\times3\times10^{8}}{4.4\times10^{-14}}$$

$$= 4.52\times10^{-12}\ \text{m}$$

59. (2)

For NaCl type structure,

Distance between A^+ and B^{-1}

$$= \frac{1}{2}\times \text{edge length}$$

$$= \frac{1}{2}\times 400 = 200\ \text{pm}$$

$\because$ Radius of cation = 75 pm

$\therefore$ Radius of anion = 200 – 75

= 125 PM

60. (1)

SO_2 has sp^2 hybridisation of S-atom while NH_3, SO_4^{2-} and H_2O species have sp^3 hybridisation.

61. (1)

Number of electron in NO_3^- = 7 + 24 + 1 = 32

Number of electron in CO_3^{2-} = 6 + 24 + 2 = 32

Hence, they are isoelectronic

Total number of valence e^- in NO_3^-

$$= 5 + 6\times3 + 1 = 24$$

Total number of valence e^- in CO_3^{2-}

$$= 4 + 6\times3 + 2 = 24$$

Now $24 \div 8 = 3(Q_1) + 0(R_1)$

Hence, Hybridisation of central atom in both cases is sp^2. Hence they are isostructural also.

62. (3)

$$2CH_3COOH \rightleftharpoons (CH_3COOH)_2$$

1 0

$1-\alpha$ $\alpha/2$

$$i = 1 - \frac{\alpha}{2}$$

$$\alpha = 2(1-i)$$

$$= 2(1-0.52) = 0.96$$

63. (1)

Electrode potential = –0.3 V

The electrode reaction may be given as

$$2H^+_{(aq)} + 2e^- \longrightarrow H_{2(g)}$$

$$E = E^\circ - \frac{0.059}{2}\log\frac{1}{[H^+]^2}$$

$$-0.3 = 0 - \frac{0.059}{2}(-2\log[H^+])$$

$$-0.3 = -0.059\ pH$$

$$pH = \frac{0.3}{0.059}$$

$$pH = 5.085$$

64. (1)

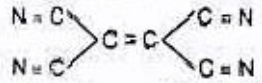
$CaCO_3$ dissociates as in a closed vessel.

$$CaCO_3(s) \rightleftharpoons CaO_{(s)} + CO_{2(g)};\ \Delta H = 110\ KJ$$

The reaction is endothermic and the pressure of CO_2 increases if temperature is raised.

65. (1)

The structure of tetracyano ethylene is as:



Hence, there are 9σ and 9π bonds are present.

66. (3)

$$56\ g\ N_2 = \frac{56}{28} = 2\ mol$$

$$44\ g\ CO_2 = \frac{44}{44} = 1\ mol$$

$$16\ g\ CH_4 = \frac{16}{16} = 1\ mol$$

$$\text{Partial pressure of } CH_4 = \frac{n_{CH_4}}{n_{N_2} + n_{CO_2} + n_{CH_4}} \times P$$

$$= \frac{1}{2+1+1} \times 720$$

$$= 180\ mm$$

67. (3)

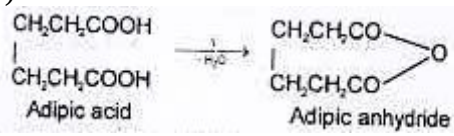
Sodium chloride is the salt of strong acid and strong base. The solution of NaCl in contact with atmosphere has a pH of about 7.

68. (3)

$CH_3COCH_2CH_2CH_3$ (2-pentanone) gives positive iodoform test while $CH_3CH_2COCH_2CH_3$ (3-pentanone) does not give iodoform test.

69. (2)

70. (3)



71. (4)

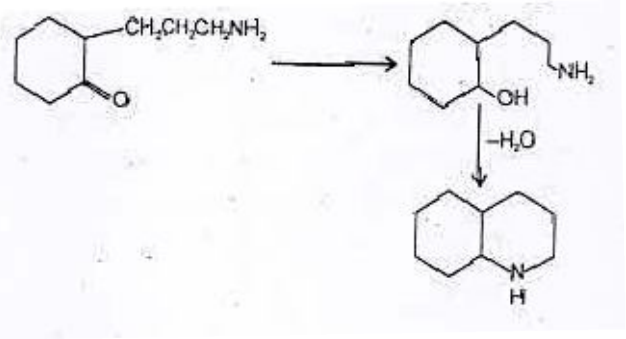
The acidity of halogenated acid increases with increase in electronegativity of the halogen present. Hence, the correct order of the acidity is as:

$FCH_2COOH > ClCH_2COOH > BrCH_2COOH > CH_3COOH$

72. (3)

$LiAlH_4$ reduces both ester and carbonyl group. $NaBH_4/CH_3OH$ reduces only carbonyl group.

73. (4)



74. (3)

Oral contraceptive drugs contain both mestranol and norethindrone.

75. (4)

Aspirin is a non-narcotic drug. It is the most common analgesis with antipyretic properties.

76. (1)

77. (1)

The amide bonds in nylon are hydrolysed by acid on base

78. (2)

$$Cu^{+} + Cu^{+} \longrightarrow Cu + Cu^{2+}$$

$$n = 1$$

$$E^{\circ}\text{ cell} = \frac{0.0591}{n}\log k$$

$$0.36 = \frac{0.0591}{1}\log k$$

$$\log k = 6.0914$$

or $$k = \text{Antilog } 6.0914 = 1.2 \times 10^{6}$$

79. (2)

$$\frac{\text{wt. of Ca}}{\text{wt. of Al}} = \frac{\text{Eq. wt. of Ca}}{\text{Eq. Wt. of Al}}$$

$$\frac{40}{\text{wt. of Al}} = \frac{40/2}{27/3}$$

Wt. of Al = 18 kg

80. (2)

81. (2)

H_2O and HSO_4^- accept protons hence they are conjugate bases.

82. (2)

$$1MH_2SO_4 = 2NH_2SO_4$$

$$N_1V_1 = N_2V_2$$

$$2 \times V_1 = 10 \times 1$$

$$V_1 = 5.0 \text{ ml}$$

83. (4)

$$\overset{+7}{KMnO_4} + \overset{-1}{HCl} \longrightarrow \overset{0}{Cl_2} + \overset{+2}{MnCl_2} + KCl + H_2O$$

Oxidation number of Mn decreases, hence $KMnO_4$ has been reduced to $MnCl_2$. Thus, the reduced product is $MnCl_2$.

84. (4)

85. (4)

Ferrocene is a sandwich complex compound in which all the five C-atoms of cyclopentadiene anion are linked to the metal through π-bonds.

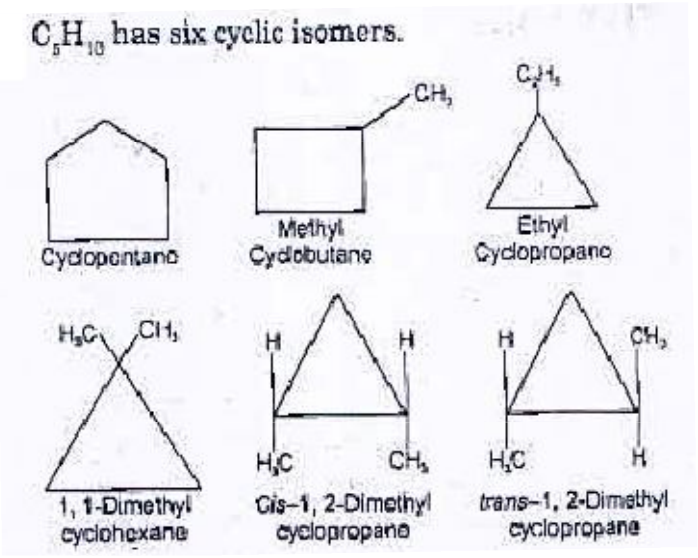
86. (3)

Yellow chromates are converted to orange dischromates on adding acid and vice-versa when alkali is added to dischromates.

$$2CrO_4^{2-} + 2H^+ \longrightarrow Cr_2O_7^{2-} + H_2O$$

87. (3)

C_5H_{10} has six cyclic isomers.



88. (4)

$P - NO_2 - C_6H_4 - CH_2^-$ is the most stable carbanion since electron withdrawing $-NO_2$ group stabilizes the carbanion by dispersal of the negative charge.

89. (3)

From slow step, rate = $K[B_2][A]$

$\because A_L \rightleftharpoons A + A$

$$K_{eq} = \frac{[A]^2}{[A_2]}$$

$$[A] = \sqrt{K_{eq}[A_2]} = K_{eq}^{1/2} A_2^{1/2}$$

$$\text{rate} = K[B_2]K_{eq}^{1/2}[A_2]^{1/2} = K^1[A_2]^{1/2}[B_2]$$

Hence, order = $1\frac{1}{2}$

90. (4)

Lithium nitrate gives O_2, NO_2 and Li_2O on heating

$$4LiNO_3 \longrightarrow 2Li_2O + 4NO_2 + O_2$$

Nitrates of other alkali metals give nitrites and O_2.

91. (1) NCERT XI: Pg. no. 11
92. (3) page no. 23, 2.3.1 Phycomycetes
93. (4) page no. 19 last paragraph, pagae no. 24, 2.3.4 Denteromycetes
94. (4) NCERT XI page 34
95. (4) NCERT XI page 38
96. (4) Plasma membrane
97. (4) Transverse junction
98. (4) After isolation ER gets fragmented.
99. (3) NCERT XI, Pg No168
100. (3) NCERT XI, Pg No.163
101. (1) NCERT pg no 78, 79, 80, 81
102. (4) NCERT pg no 78, 79
103. (2) NCERT pg no 80
104. (3) page no. 90 , 6.3.1 , page no. 91, 6.3.2
105. (2) page no. 89 , 6.2.2 the ground tissue system
106. (4) Osmosis (less conc. solution $\rightarrow$ more conc. solution)
107. (2) Xylem conduction do not need osmosis.
108. (2) Pg. no. 201
109. (1) Pg. no. 204
110. (2) NCERT pg no 215
111. (2) Cyanobacteria perform oxygenic photosynthesis and have both PS-I and PS-II
112. (1) NCERT pg no 218
113. (4) page no 228,229 , 14.2 Glycolyctis
114. (3) page no page no 234, 14.5 The respiratory balance sheet
115. (1) page no 228 , 14.2 Glycolysis
116. (4) Pomation = cytokin intgibberlelin
117. (2) NCERT XI page 241
118. (4) It is due to kinetin
119. (1) NCERT XII page 7
120. (1) 2 celled stage
121. (3) Secondary nucleus and nucellus are diploid
122. (1) Suspenssor push the embryo into endosperm.
123. (1) page no 74 , last paragraph
124. (2) page no 77 , 5.2.2.2 , co- dominance
125. (4) Examples of antosomal recessive traits
126. (3) Rest of the three has stop codon in middle, thus the translation beyond that is not possible.
127. (4) NCERT XII, Pg. no.116

128. (3) T ψ C terminus of tRNA is called ribosomal attachment site

129. (4) NCERT XII page 177

130. (1) NCERT XII page 173

131. (1) NCERT pg no 180, 181

132. (3) HSC pg no 56

133. (4) A zone of transition between to ecosystems.

134. (2) Different species of unit area is community.

135. (4) NCERT-XII Pg.no.244

136. (1) NCERT-XII Pg.no.246

137. (1) Rain forest of North-East India

138. (2) NCERT XII page 262

139. (2) HSC pg no 255

140. (2) HSC pg no 254

London smog- rich in SO_2, and was coal induced

141. (4)

142. (2)

143. (3)

144. (3) Ventral diaphragm is between perivisceral and perineural sinuses.

145. (3) Fifth month

146. (3)

147. (3)

148. (2) Antitoxin and serum contain antibodies

149. (1)

150. (4)

151. (2) Deuterostome in which the first opening becomes anus and indeterminate in which fate of cells in not determined is in echinoderms and chordates.

152. (2) Pg 48,2nd para

153. (4) Birds due to there volant adaptation have pneumatic bones

154. (2) Corpora striata is present at the ventrolateral wall of forebrain.It is the part of basal ganglia.

155. (1) Telencephalon is an embryonic name of cerebrum.Amygdala is a part of limbic system which is present in cerebrum.

156. (3) Occulomotor,3rd cranial nerve supplies extraocular muscles which is responsible for movement of eyeball.

157. (2) Hypersecretion of growth hormone causes gigantism in which gorilla like appearance of hands and legs are there.

158. (3) Milk ejection is stimulated by oxytocin.Milk production by prolactin and FSH stimulates growth of ovarian follicles.

159. (3) Pg 338,2nd para

160. (2) Hilsa is a marine fish. Rest all are freshwater.

161. (1) Pg 306 NCERT XI

162. (3)

163. (3)

164. (2)

165. (3)

$p + q = 1$

$p=0.7 \ \therefore \ q=0.3$

$p^2 + 2pq + q^2 = 1$

$q^2 = (03)^2 = 0.09$

166. (2)

167. (1)

168. (1)

169. (4)

170. (2) C-peptide containing 30 AA is removed

171. (4) Methionine and cysteine are sulphur containing amino acids

172. (3)

173. (3) Residual volume is left after forceful exhalation.

174. (1)

175. (1)

176. (1) Tripalmitin is a triglyceride containing glycerol ($C_3 H_8 O_3$) and three palmitic acids ($C_{16} H_{32} O_2$). When the formation takes place 3 water molecules are removed. Thus molecular formular of tripalmitin is $C_3 H_8O_3 + 3 (C_{16} H_{32} O_2) – 3 H_2 O = C_{51} H_{98} O_6$

177. (2)

178. (2)

179. (4)

180. (2)