TEST – 6

ANSWERS

1.	(4)	41.	(1)	81.	(1)	121.	(1)	161.	(3)
2.	(2)	42.	(3)	82.	(2)	122.	(3)	162.	(4)
3.	(4)	43.	(4)	83.	(4)	123.	(3)	163.	(2)
4.	(2)	44.	(2)	84.	(1)	124.	(3)	164.	(1)
5.	(2)	45.	(2)	85.	(3)	125.	(3)	165.	(3)
6.	(4)	46.	(2)	86.	(1)	126.	(2)	166.	(3)
7.	(4)	47.	(1)	87.	(2)	127.	(2)	167.	(2)
8.	(1)	48.	(1)	88.	(1)	128.	(3)	168.	(2)
9.	(1)	49.	(3)	89.	(2)	129.	(4)	169.	(2)
10.	(3)	50.	(2)	90.	(4)	130.	(2)	170.	(4)
11.	(2)	51.	(4)	91.	(3)	131.	(4)	171.	(3)
12.	(2)	52.	(2)	92.	(4)	132.	(2)	172.	(2)
13.	(4)	53.	(4)	93.	(1)	133.	(2)	173.	(1)
14.	(4)	54.	(3)	94.	(1)	134.	(2)	174.	(2)
15.	(2)	55.	(1)	95.	(3)	135.	(2)	175.	(1)
16.	(3)	56.	(1)	96.	(2)	136.	(4)	176.	(2)
17.	(4)	57.	(4)	97.	(1)	137.	(3)	177.	(3)
18.	(1)	58.	(4)	98.	(1)	138.	(1)	178.	(3)
19.	(3)	59.	(3)	99.	(1)	139.	(3)	179.	(1)
20.	(1)	60.	(2)	100.	(3)	140.	(1)	180.	(2)
21.	(4)	61.	(3)	101.	(3)	141.	(3)	181.	(2)
22.	(2)	62.	(2)	102.	(3)	142.	(2)	182.	(4)
23.	(2)	63.	(3)	103.	(1)	143.	(3)	183.	(1)
24.	(2)	64.	(3)	104.	(4)	144.	(1)	184.	(3)
25.	(3)	65.	(2)	105.	(3)	145.	(1)	185.	(2)
26.	(3)	66.	(1)	106.	(3)	146	(3)	186.	(3)
27.	(3)	67.	(3)	107.	(2)	147.	(1)	187.	(2)
28.	(4)	68.	(1)	108.	(2)	148.	(2)	188.	(1)
29.	(2)	69.	(3)	109.	(1)	149.	(1)	189.	(3)
30.	(1)	70.	(4)	110.	(2)	150.	(4)	190.	(2)
31.	(2)	71.	(2)	111.	(1)	151.	(1)	191.	(3)
32.	(1)	72.	(1)	112.	(3)	152.	(2)	192.	(1)
33.	(2)	73.	(4)	113.	(4)	153.	(2)	193.	(1)
34.	(4)	74.	(3)	114.	(3)	154.	(4)	194.	(4)
35.	(3)	75.	(4)	115.	(3)	155.	(3)	195.	(2)
36.	(1)	76.	(4)	116.	(3)	156.	(3)	196.	(1)
37.	(1)	77.	(1)	117.	(4)	157.	(4)	197.	(4)
38.	(1)	78.	(1)	118.	(3)	158.	(3)	198.	(2)
39.	(1)	79.	(2)	119.	(3)	159.	(3)	199.	(1)
40.	(4)	80.	(1)	120.	(4)	160.	(3)	200.	(2)

Hints to Selected Questions

[PHYSICS]

1. Answer (4)
2. Answer (2)

   $\Delta l = \alpha l\, \Delta\theta$

   $10^{-3} = 10^{-4} \times 20 \times 10^{-2} \times \Delta\theta$

   $\Delta\theta = 50°C$

   Upper limit = 60 + 50 = 110°C
3. Answer (4)

   Real gas molecules have also potential energy.
4. Answer (2)

   Use formula $P = \frac{1}{3} mNv_{rms}^2$
5. Answer (2)
6. Answer (4)

   rms speed doesn't depend on nature of gas and $U_{rms} = \sqrt{\frac{3RT}{M}}$.
7. Answer (4)

   $\frac{Q}{T} = KA\left(\frac{\Delta T}{l}\right)$

   $T \propto \frac{1}{K}$

   $\frac{t_1}{t_2} = \frac{K_2}{K_1} = \frac{1}{5}$
8. Answer (1)
9. Answer (1)

   Equation of the process is PV^{-1}= constant ($\alpha = -1$)

   $W = \frac{nR\Delta T}{1-\alpha} = \frac{nR \times 3T_0}{2}$

   $= \frac{3}{2} nRT_0$
10. Answer (3)
11. Answer (2)

    Area $\propto T^4$

    and $\lambda_m \propto \frac{1}{T}$

    $\frac{A_1}{A_2} = \left(\frac{T_1}{T_2}\right)^4 = \left(\frac{\lambda_2}{\lambda_1}\right)^4 = \left(\frac{3}{2}\right)^4 = \frac{81}{16}$
12. Answer (2)
13. Answer (4)

    Use $\frac{T_1 - T_2}{t} = K\left(\frac{T_1 + T_2}{2} - T_0\right)$
14. Answer (4)

    $(C_v)_{mixture} = \frac{n_1 C_{v_1} + n_2 C_{v_2}}{n_1 + n_2}$
15. Answer (2)
16. Answer (3)

    From Wein's displacement law

    $\lambda_m \propto \frac{1}{T}$
17. Answer (4)
18. Answer (1)
19. Answer (3)
20. Answer (1)
21. Answer (4)
22. Answer (2)

    $\frac{1}{2} mu^2 = \frac{5}{2} R\Delta T \Rightarrow u = \sqrt{\frac{5R\Delta T}{M}}$

    M = molar mass
23. Answer (2)

    Adiabatic bulk modulus

    $B = \gamma p$

    Compressibility

    $K = \frac{1}{B} = \frac{1}{\gamma P} = \frac{3}{5P}$
24. Answer (2)
25. Answer (3)
26. Answer (3)

    PV^{-3} = constant

    $C = C_v + \frac{R}{1-\alpha}$

    $= \frac{3R}{2} + \frac{R}{1+3} = \frac{7R}{4}$

27. Answer (3)
28. Answer (4)
29. Answer (2)

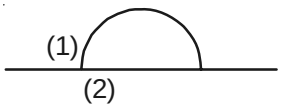
    $200\ x = 350\ y$

    $T_x = \frac{7}{4}T_y$
30. Answer (1)
31. Answer (2)

    $\frac{H_1}{H_2} = \frac{R_2}{R_1} = \frac{I_2}{I_1} = \frac{60}{70} = \frac{6}{7}$

    $H_1 = \frac{6}{13} \times 130$

    = 60 W



32. Answer (1)

    Net work done

    $= W_{A\to B} + W_{B\to C} + W_{C\to D} + W_{D\to A}$

    $= 0 + nR\Delta T_1 + 0 - nR\Delta T_2$

    $= 3R \times 4T_0 - 3R \times 2T_0$

    $= 12\ RT_0 - 6RT_0 = 6RT_0$
33. Answer (2)
34. Answer (4)
35. Answer (3)
36. Answer (1)

    $\frac{P_{100} - P_0}{P_t - P_0} = \frac{100 - 0}{t - 0}$
37. Answer (1)
38. Answer (1)
39. Answer (1)
40. Answer (4)
41. Answer (1)
42. Answer (3)
43. Answer (4)

    Use, $\Delta U = Q - W$
44. Answer (2)

    $(\text{Slope})_{\text{adiabatic}} = \gamma(\text{slope})_{\text{isothermal}} = \frac{5}{3}m$
45. Answer (2)
46. Answer (2)
47. Answer (1)
48. Answer (1)
49. Answer (3)
50. Answer (2)

[CHEMISTRY]

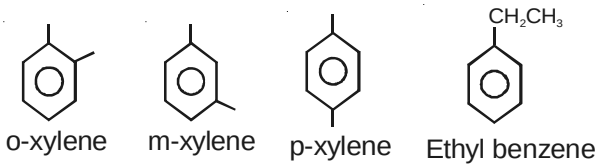
51. Answer (4)
52. Answer (2)
53. Answer (4)

    Word root – pent

    Primary suffix – ane

    Primary prefix – cyclo

    Secondary prefix – 3-methyl butyl
54. Answer (3)
55. Answer (1)
56. Answer (1)



o-xylene m-xylene p-xylene Ethyl benzene

57. Answer (4)
58. Answer (4)

    Keto-enol tautomerism

    Compound have 2-acidic hydrogen.
59. Answer (3)

    In this compound no two similar groups are present.
60. Answer (2)
61. Answer (3)

    (1) True → 1° amine and 2° amine

    (2) II & IV → Metamers → –R gp changes
62. Answer (2)
63. Answer (3)
64. Answer (3)
65. Answer (2)

    Carbon (2) & (3) → sp^2 → = bonds

    Nitrogen has unshared pair of electrons and is adjacent to the π bond so, sp^2 hybridized.
66. Answer (1)

    In (2) & (4) are symmetrical, resultant dipole is zero.

    In (1) bond moment are towards the same direction but in (3) there is net dipole at C_2 position.

    (2) = (4) < (3) < (1)

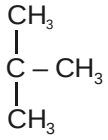
67. Answer (3)

$CH_3 - N = C = O$

$6\sigma, 2\pi$

68. Answer (1)

69. Answer (3)

Neopentane $\rightarrow$ Symmetrical alkane 

give only one monosubstituted product.

70. Answer (4)

71. Answer (2)

72. Answer (1)

It is non-planar species.

73. Answer (4)

Both are electrons deficient or both are electrons rich.

74. Answer (3)

Allyl radical is most stable than benzyl radical due to the less C–H bond energy.

75. Answer (4)

76. Answer (4)

77. Answer (1)

78. Answer (1)

Resonance in (1)

79. Answer (2)

80. Answer (1)

The basicitiy order will be inversely proportional to resonance stability of lone pairs.

81. Answer (1)

82. Answer (2)

IV is most stable being 3° and resonance stabilized

III is 2° and resonance stabilized

II is 3° and I is 2°

83. Answer (4)

84. Answer (1)

85. Answer (3)

86. Answer (1)

87. Answer (2)

88. Answer (1)

89. Answer (2)

Least number of $\propto$ H in ethene.

90. Answer (4)

91. Answer (3)

$$\% \text{ of } N = \frac{1.4 \times N \times V}{\text{Wt. of substance}}$$

92. Answer (4)

93. Answer (1)

94. Answer (1)

95. Answer (3)

96. Answer (2)

97. Answer (1)

98. Answer (1)

99. Answer (1)

100. Answer (3)

[BIOLOGY]

101. Answer (3)

102. Answer (3)

Elements must be directly involved in the metabolism of plant.

103. Answer (1)

104. Answer (4)

Rhizobium does nitrogen fixation in leguminous plants but *Frankia* (actinomycetes) fix nitrogen in non-leguminous plants.

Pseudomonas, *Casuarina* are denitrifying bacteria.

105. Answer (3)

106. Answer (3)

107. Answer (2)

108. Answer (2)

Thiamine.

109. Answer (1)

Fist phase $\rightarrow$ apoplastic.

110. Answer (2)

111. Answer (1)

112. Answer (3)

Micronutrient are trace elements.

113. Answer (4)

Mg^{++} is an activator of RUBISCO and phosphoenol pyruvate.

114. Answer (3)

Mitotic spindle formation is due to Ca^{++} (calmodulin).

115. Answer (3)

116. Answer (3)

For $1CO_2 \rightarrow$ 8 quanta are required

117. Answer (4)

Biological nitrogen fixation performed by certain prokaryotes only, not by all prokaryotes.

118. Answer (3)

Nitrogen deficiency symptoms first appear in older leaf and cause chlorosis.

119. Answer (3)

120. Answer (4)

121. Answer (1)

In *Casuarina*, *Frankia* live symbiotically.

122. Answer (3)

Hydroponic is a soil less culture.

123. Answer (3)

124. Answer (3)

125. Answer (3)

126. Answer (2)

127. Answer (2)

128. Answer (3)

129. Answer (4)

130. Answer (2)

Photorespiration involves oxygenase activity of Rubisco.

131. Answer (4)

Orientation of leaves $\rightarrow$ internal/plant factor.

132. Answer (2)

ATP and NADPH are products of ETS in chloroplast.

133. Answer (2)

1st product is 3-phosphoglyceric acid which is a 3 carbon compound hence Calvin cycle called as C_3 cycle.

134. Answer (2)

135. Answer (2)

136. Answer (4)

Pyrrole ring is absent.

137. Answer (3)

In Kranz anatomy bundle sheath cells present around vascular bundle have no intercellular spaces.

138. Answer (1)

139. Answer (3)

140. Answer (1)

For 1 glucose, 12 additional ATP are required. Maltose is a disaccharide.

141. Answer (3)

In photorespiration there is a release of CO_2 with utilisation of ATP.

142. Answer (2)

143. Answer (3)

144. Answer (1)

145. Answer (1)

146 Answer (3)

147. Answer (1)

Globulins act as antibodies. Enlarged monocytes become macrophages.

148. Answer (2)

Eustachian valves guard the opening of inferior vena cava into right auricle.

149. Answer (1)

150. Answer (4)

151. Answer (1)

Colle's fracture is a fracture in the distal end of radius.

152. Answer (2)

Parietal and temporal bones of skull are paired bones.

153. Answer (2)

In a second class lever, load is in the middle of fulcrum and effort.

154. Answer (4)

155. Answer (3)

156. Answer (3)

Benzoic acid + glycine $\longrightarrow$ Hippuric acid

Benzoic acid + ornithine $\longrightarrow$ Ornithuric acid formed in birds

157. Answer (4)

ANF – Atrial natriuretic factor

158. Answer (3)

159. Answer (3)

160. Answer (3)

161. Answer (3)

162. Answer (4)

Bicuspid valves separate left atrium from left ventricle

163. Answer (2)

164. Answer (1)

Minimum urea is present in renal vein.

165. Answer (3)

166. Answer (3)

The threshold value of glucose is 180 mg / 100 ml of blood

167. Answer (2)

168. Answer (2)

Renal blood flow = 1300 ml/min

Renal plasma flow = 715 ml/min
(55% of renal blood flow)

169. Answer (2)

Water reabsorption in PCT is obligatory.

170. Answer (4)

171. Answer (3)

172. Answer (2)

173. Answer (1)

Myosin filaments are attached to Z-lines on both sides by titin protein.

174. Answer (2)

175. Answer (1)

176. Answer (2)

177. Answer (3)

178. Answer (3)

179. Answer (1)

180. Answer (2)

181. Answer (2)

182. Answer (4)

Reabsorption of Na^+ ions with glucose and amino acids occurs in PCT.

183. Answer (1)

184. Answer (3)

Myxine and cartilaginous fishes are osmoconformer vertebrates.

185. Answer (2)

186. Answer (3)

187. Answer (2)

188. Answer (1)

189. Answer (3)

Red muscle fibres have less developed endoplasmic reticulum.

190. Answer (2)

191. Answer (3)

Decarboxylation of malic acid takes place in day time.

192. Answer (1)

193. Answer (1)

PS II is located on the inner side of membrane of thylakoid.

194. Answer (4)

195. Answer (2)

196. Answer (1)

197. Answer (4)

198. Answer (2)

199. Answer (1)

200. Answer (2)

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