

**TEST - 7****ANSWERS**

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



## Hints to Selected Questions

### [PHYSICS]

1. Answer (1)

2. Answer (3)

$$\frac{2\pi}{T} = 50\pi \Rightarrow \frac{1}{T} = \frac{50\pi}{2\pi} \Rightarrow T = 0.04 \text{ s}$$

3. Answer (1)

$$\frac{d^2x}{dt^2} = -\omega^2 x$$

4. Answer (4)

Spring cut in 2 parts so,  $k' = 2k$ 

$$T = 2\pi \sqrt{\frac{m}{(2k+2k)}} = \pi \sqrt{\frac{m}{k}}$$

5. Answer (1)

(a) &amp; (b) arrangement are in parallel

(c) arrangement is in series

6. Answer (2)

$$\tau = l\alpha$$

$$\left(\frac{mgl}{2} + mgl\right)\theta = -\frac{4}{3}ml^2\alpha \quad \left\{ I = \frac{1}{3}ml^2 + ml^2 \right.$$

$$\Rightarrow \frac{3mgl}{2}\theta = -\frac{4}{3}ml^2\alpha$$

$$\Rightarrow -\frac{9g}{8l}\theta = \alpha$$

$$\omega^2 = \frac{9g}{8l} \Rightarrow T = 2\pi \sqrt{\frac{8l}{9g}}$$

7. Answer (4)

$$T = 12 \text{ s}$$

$$A = 10 \text{ cm}$$

$$\delta = \frac{\pi}{6} \text{ (Because } A \text{ is half at } t = 0)$$

8. Answer (3)

$$\frac{\partial U}{\partial x} = -f \Rightarrow -40x = ma \quad [m = 10 \text{ kg}]$$

$$a = \frac{-40}{10}x \Rightarrow a = -4x$$

$$T = 2\pi \sqrt{\frac{1}{4}} = \pi \text{ s}$$

9. Answer (3)

$$T = 2\pi \sqrt{\frac{m}{k}}$$

$$T^2 k = \text{constant}$$

$$\therefore T \propto \frac{1}{\sqrt{k}}$$

10. Answer (1)

11. Answer (4)

12. Answer (2)

$$\frac{2\pi}{\lambda} \text{ (Path difference = phase difference)}$$

$$\frac{2\pi}{\lambda} \Delta x = \frac{\pi}{3}$$

$$\Rightarrow \Delta x = \frac{\lambda}{6}$$

13. Answer (3)

$$R = \sqrt{a_1^2 + a_2^2 + 2a_1a_2 \cos \phi}$$

$$\phi = \frac{\pi}{2}$$

$$R = \sqrt{a^2 + a^2 + 2a.a \cos 90} = \sqrt{2}a$$

14. Answer (1)

$$\Delta t = \frac{1}{|n_1 - n_2|} = \frac{1}{|45 - 46|} = 1 \text{ s}$$

15. Answer (1)



16. Answer (4)

$$n_1 = n_2 \pm n$$

$$n_1 = 50 \pm 5 = 45 \text{ Hz, } 55 \text{ Hz.}$$

17. Answer (3)

18. Answer (1)

$$I_{\max} = (\sqrt{I_1} + \sqrt{I_2})^2 = (\sqrt{5} + \sqrt{5})^2 = 20 \text{ unit.}$$

19. Answer (2)

20. Answer (1)

Possible frequency =  $250 + 4 = 254 \text{ Hz}$   
 " " =  $250 - 4 = 246 \text{ Hz}$   
 Since loading decreases frequency. So 254 will be correct.

21. Answer (1)

$$\frac{330 - V}{330 + V} = 0.95 \Rightarrow V = 8.46 \text{ m/s}$$

22. Answer (1)

$$\left[ k \left( \frac{l}{2} \right) \theta \right] l = I \alpha$$

$$\alpha = \frac{kl^2}{2I} \theta \Rightarrow \alpha = \frac{kl^2}{2 \times \frac{1}{12} ml^2} \theta \Rightarrow \alpha = 6 \frac{k}{m} \theta$$

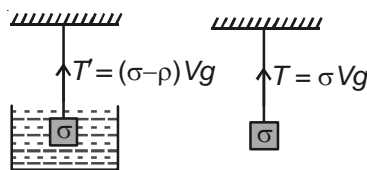
$$T = \pi \sqrt{\frac{2m}{3k}} = \sqrt{2} \pi$$

23. Answer (1)

$$k = \frac{k_1 k_2}{(k_1 + k_2)}; \quad T = 2\pi \sqrt{\frac{m}{k}}$$

24. Answer (3)

$$f = \frac{1}{2L} \sqrt{\frac{T}{\mu}}$$



$$T = \sigma Vg - \rho Vg$$

$$f = \frac{1}{2L} \sqrt{\frac{\sigma Vg}{\mu}}$$

$$f' = \frac{1}{2L} \sqrt{\frac{(\sigma - \rho)Vg}{\mu}}$$

$$f' = f \left( \frac{\sigma - \rho}{\sigma} \right)^{1/2}$$

25. Answer (1)

$$V = \sqrt{\frac{\gamma RT}{M}}$$

$$\Rightarrow \frac{V_0}{V_{\text{He}}} = \sqrt{\frac{\gamma_0 M_{\text{He}}}{\gamma_{\text{He}} M_0}} = \sqrt{\frac{7/5 \cdot 4}{5/3 \cdot 32}} = \frac{1}{10} \sqrt{\frac{21}{2}}$$

26. Answer (4)

Distance between adjacent node is =  $\frac{\lambda}{2}$

$$k = \frac{2\pi}{\lambda} \Rightarrow \frac{\lambda}{2} = \frac{\pi}{k}$$

27. Answer (1)

$$V = \sqrt{\frac{B}{\rho}} = \sqrt{\frac{7.5 \times 10^9}{3 \times 10^4}} = \frac{1}{2} \times 10^3 = 500 \text{ m/s}$$

28. Answer (2)

$$\frac{v_2}{v_1} = 4 \Rightarrow \frac{v_2}{v_1} = \sqrt{\frac{T_2}{T_1}} = \frac{T_2}{T_1} = \left( \frac{v_2}{v_1} \right)^2$$

$$\frac{T_2}{273} = \frac{16}{1} \Rightarrow T_2 = 16 \times 273 \text{ K}$$

29. Answer (1)

$$V = \sqrt{\frac{\gamma RT}{M}}$$

$$\frac{\Delta V}{V} = \frac{1}{2} \frac{\Delta T}{T}$$

$$\frac{\Delta V}{V} \times 100 = \frac{1}{2} \times 1 = \frac{1}{2} \%$$

30. Answer (1)

31. Answer (3)

32. Answer (1)

$$\frac{I_{\max}}{I_{\min}} = \frac{(a_1 + a_2)^2}{(a_1 - a_2)^2} = \frac{\left( \frac{3}{2} + 1 \right)^2}{\left( \frac{3}{2} - 1 \right)^2} = \frac{25}{1}$$

33. Answer (3)

As per reflection from rigid surface phase change is equal to  $\pi$  and direction opposite to previous one.

34. Answer (3)

35. Answer (1)

$$\frac{dy}{dt} = V = A\omega \cos(\omega t - kx)$$

$$V_{\max} = A\omega$$

36. Answer (3)

$x = 0$  is mean position where  $V$  is max and  $\Delta x = 0$ , so KE is max ( $K_{\max}$  = total energy) and potential energy is zero (min).



37. Answer (3)

Velocity of wave is independent of frequency.

38. Answer (2)

39. Answer (1)

40. Answer (1)

41. Answer (1)

42. Answer (1)

43. Answer (4)

44. Answer (4)

$$V \propto \frac{1}{\sqrt{M}}$$

SO<sub>2</sub> having max. M = 64.

51. Answer (2)

n-octane has largest surface area.

52. Answer (4)

Grignard reagent is strong base therefore accept acidic hydrogen and form alkane.

53. Answer (1)

Wurtz reaction undergoes disproportionation reaction.

54. Answer (3)

Cyclopropane has bond angle 60° therefore maximum angle strain.

55. Answer (4)

Toluene has activating -CH<sub>3</sub> group therefore gives Friedel craft reaction.

56. Answer (1)

Phenyl group is o and p directing.

57. Answer (2)

Dehydrohalogenation and ring expansion.

58. Answer (3)

$$\text{Heat of hydrogenation} \propto \frac{1}{\text{stability}}$$

59. Answer (1)

$$s \text{ character} \propto \frac{1}{\text{bond length}}$$

60. Answer (2)

Stability of carbocation increases on increasing number of hyperconjugation.

45. Answer (2)

$$f \propto \frac{1}{l}$$

$$\frac{1}{n} \propto l; \frac{1}{n_1} \propto l_1 \text{ and } \frac{1}{n_2} \propto l_2$$

$$\therefore l = l_1 + l_2$$

$$\therefore \frac{1}{n} = \frac{1}{n_1} + \frac{1}{n_2}$$

46. Answer (4)

47. Answer (1)

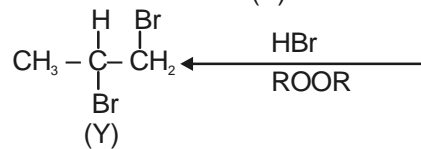
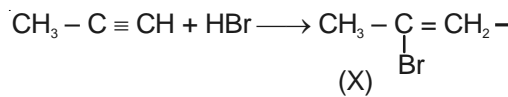
48. Answer (1)

49. Answer (2)

50. Answer (1)

## [CHEMISTRY]

61. Answer (1)



62. Answer (4)

Anti-Markovnikov addition observe only when HBr is added to unsymmetrical alkenes in presence of organic peroxide.

63. Answer (3)

Addition of HBr in presence of peroxide takes place by free radical mechanism.

64. Answer (3)

65. Answer (4)

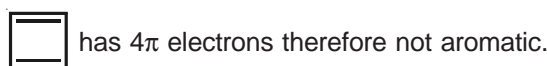
Terminal alkynes give positive Tollen's test.

66. Answer (2)

67. Answer (2)

After removing H<sup>+</sup> from C-5 compound changes to aromatic.

68. Answer (3)



69. Answer (4)

Symmetrical ketoxime do not show geometrical isomerism.



70. Answer (2)
71. Answer (4)  
The product of aromatization of n-heptane is Toluene therefore hybridization is  $sp^3$  and  $sp^2$ .
72. Answer (2)  
Unsaturated compound give bromine-water test.
73. Answer (1)
74. Answer (3)  
In direct hydration rearrangement takes place.
75. Answer (2)
76. Answer (2)
77. Answer (1)  
Fact
78. Answer (3)  
Fact
79. Answer (4)  
 $CH_3 - CH_2 - CH \neq C(CH_3)_2$  on ozonolysis gives propanal and propanone which is isomers.
80. Answer (1)  
Fact
81. Answer (1)  
 $-OCH_3$  activates benzene ring by resonance whereas  $-CH_3$  activates by hyperconjugation towards electrophilic substitution and  $-CCl_3$ , deactivates.
82. Answer (3)
83. Answer (4)  
Straight chain and branch chain carbon have different octane number.
84. Answer (2)  
In tert-butyl benzene, tert-carbon does not have hydrogen therefore can't be oxidized by  $KMnO_4$ .
85. Answer (4)  
Fact
86. Answer (1)
87. Answer (3)  
Fact
88. Answer (1)  
Fact
89. Answer (4)  
Fact
90. Answer (4)  
Fact
91. Answer (3)  
Fact
92. Answer (3)  
Fact
93. Answer (2)
94. Answer (1)
95. Answer (4)
96. Answer (4)  
Alkyne is more reactive than alkene towards hydrogenation.
97. Answer (2)
98. Answer (4)  
Attack of halogen on benzene is rate determining step.
99. Answer (1)
100. Answer (2)

## [BIOLOGY]

101. Answer (2)  
It is followed.
102. Answer (1)  
Essentially accompanied by metabolism.
103. Answer (2)
104. Answer (1)  
Cell is differentiated in maturation zone.
105. Answer (4)  
Ideal curve is sigmoid.
106. Answer (3)  
Pecto-cellulosic thickenings in collenchyma.
107. Answer (1)  
*Ranunculus* (Buttercup) - Environmental heterophylly.
108. Answer (1)  
 $C_2H_4$
109. Answer (4)  
Dormin is another name of ABA.
110. Answer (2)  
GA - Increased length of grape stalks.



111. Answer (1)  
Mostly adenines.
112. Answer (2)  
Application of  $GA_3$ .
113. Answer (2)  
Internodal elongation in biennial plants (bolting)- $GA_3$
114. Answer (2)  
Violaxanthin for ABA.
115. Answer (2)
116. Answer (3)  
Shoot apices – vernalisation.
117. Answer (4)  
*Xanthium* (Cocklebur) – SDP.
118. Answer (4)
119. Answer (2)  
CCC - Anti  $GA_3$ .
120. Answer (4)
121. Answer (3)  
> 1 for organic acids.
122. Answer (2)  
Dicarboxylic acid cycle –  $C_4$  path.
123. Answer (3)  
no release of  $H_2O$ .
124. Answer (2)  
40 ATP is gross.
125. Answer (1)  
Fat and proteins can also be respired.
126. Answer (2)  
Catalytic site in  $F_1$ .
127. Answer (4)  
Cytochrome c accepts  $e^-$  from complex III.
128. Answer (2)  
UQ is a mobile carrier.
129. Answer (4)  
Associated with cytochrome  $a_3$ .
130. Answer (3)
131. Answer (2)  
No decarboxylation.
132. Answer (1)  
1  $FADH_2$  per Krebs cycle.
133. Answer (3)  
 $3 + 12 \text{ ATP} = 15$
134. Answer (1)  
Others are dehydrogenations only
135. Answer (4)  
OAA (4C)
136. Answer (2)
137. Answer (1)
138. Answer (2)  
1 atom for each dehydrogenating agent.
139. Answer (3)  
*Eleusine* - a  $C_4$  grass; others are succulents.
140. Answer (4)  
Both are 4C acids.
141. Answer (4)
142. Answer (2)  
Produces 12 NADPH
143. Answer (2)  
Far red for SDP.
144. Answer (4)  
Only complex - I operates.
145. Answer (2)
146. Answer (3)
147. Answer (1)
148. Answer (4)
149. Answer (4)
150. Answer (2)
151. Answer (2)  
Corpus callosum is the band of nerve fibres connect two cerebral hemispheres in human.
152. Answer (1)
153. Answer (1)
154. Answer (3)  
Hypothalamus through connection with the pituitary gland control growth and sexual behaviour.
155. Answer (2)
156. Answer (2)
157. Answer (3)
158. Answer (2)
159. Answer (4)
160. Answer (2)  
Foramen of Monro or interventricular foramen connects lateral ventricles to 3<sup>rd</sup> ventricle.



161. Answer (4)  
162. Answer (1)  
163. Answer (3)  
164. Answer (3)  
165. Answer (1)  
166. Answer (2)  
167. Answer (3)  
Meissner's corpuscles are present in the papillary layer of dermis and respond to touch and gentle pressure.
168. Answer (4)  
Ruffini's corpuscles are present in papillary layer of dermis and are stimulated by high temperature.
169. Answer (2)  
Bowman's glands or olfactory glands secrete mucus to spread over the epithelium to keep it moist.
170. Answer (1)  
Gland of Moll is modified sweat gland present in the edges of the eyelids.
171. Answer (2)  
172. Answer (2)  
173. Answer (2)  
174. Answer (3)  
175. Answer (2)  
Gull's disease or myxedema is characterised by puffy appearance of face and lack of alertness.
176. Answer (1)  
177. Answer (4)  
178. Answer (2)  
179. Answer (3)  
Thymosin hormone is secreted from thymus gland.
180. Answer (4)  
181. Answer (2)  
182. Answer (3)  
Steroid and thyroid hormones are lipid soluble. They directly enter in cell and bind with intracellular receptors. Cortisol and iodothyronines are lipid soluble.
183. Answer (4)  
184. Answer (3)  
185. Answer (2)  
Tetany is caused due to deficiency of parathormone. It is characterised by sustained contractions of muscles of larynx, face, hands and feet.
186. Answer (2)  
187. Answer (2)  
188. Answer (1)  
Oxytocin is synthesized in hypothalamus and released from posterior lobe of pituitary.
189. Answer (4)  
190. Answer (3)  
191. Answer (4)  
By winter varieties.
192. Answer (2)  
193. Answer (4)  
194. Answer (3)  
Auxin inhibits abscission in younger organs.
195. Answer (1)  
These are UQ and cytochrome c.
196. Answer (4)  
Meninges are also present around the spinal cord.
197. Answer (2)  
198. Answer (3)  
199. Answer (4)  
200. Answer (1)

