



Aakash

Medical | IIT-JEE | Foundations

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FINAL TEST SERIES for NEET-2025

MM : 720

Test - 7

Time : 180 Mins.

Answers

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

Hints and Solutions

PHYSICS

(1) Answer : (1)

Solution:

$$LC = \frac{\text{Pitch}}{\text{Number of divisions on circular scale}}$$

$$= \frac{1 \text{ mm}}{50} = 0.02 \text{ mm}$$

(2) Answer : (1)

Solution:

$$\chi = \mu_r - 1$$

$$= 5500 - 1$$

$$= 5499$$

(3) Answer : (2)

Solution:

$$(2\pi R)4 = 6.28 = 2\pi$$

$$R = \frac{1}{4} \text{ m}$$

$$M = NiA$$

$$= 4 \times 1 \times \pi \left(\frac{1}{4}\right)^2$$

$$= \frac{\pi}{4}$$

(4) Answer : (1)

Solution:

When velocity becomes zero at that instant it changes its direction

Slope of this curve represents acceleration, therefore acceleration is constant.

$$\text{Displacement} = \frac{1}{2} \times 10 \times 10 - \frac{1}{2} \times 10 \times 10$$

$$= 50 - 50$$

$$= \text{Zero}$$

(5) Answer : (1)

Solution:

$$2 \times 60\mu = 30$$

$$\mu = \frac{1}{4}$$

$$= 0.25$$

(6) Answer : (3)

Solution:

When the body reaches the ground.

$$v_x = v_y$$

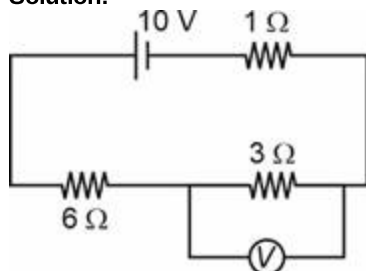
$$v_y = gt$$

$$= 10 \times 2$$

$$= 20 \text{ m/s}$$

(7) Answer : (1)

Solution:



$$I = \frac{10}{10}$$

$$= 1 \text{ A}$$

$$V = IR$$

$$= 3 \text{ V}$$

(8) Answer : (3)

Solution:

$$\begin{aligned}\text{Maximum possible deviation} &= \pi - 2C \\ &= 180 - 2 \times 30 \\ &= 120^\circ\end{aligned}$$

(9) Answer : (1)

Solution:

Thin films produce interference of light because of which soap film in sun light appears colourful.

(10) Answer : (2)

Solution:

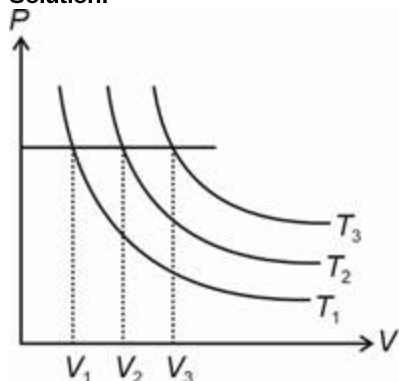
First law of thermodynamics is special case of law of conservation of energy.

(11) Answer : (2)

Solution:

$$\begin{aligned}l_f &= l_0(1 + \alpha \Delta t) \\ 4.01 &= 4(1 + 100\alpha) \\ \alpha &= \frac{0.01}{400} \Rightarrow \alpha = \frac{1}{4} \times 10^{-4} \\ &= 2.5 \times 10^{-5} \text{ C}^{-1}\end{aligned}$$

(12) Answer : (2)

Solution:

$$V_3 > V_2 > V_1$$

$$T = \frac{PV}{nR}$$

$$T_3 > T_2 > T_1$$

(13) Answer : (1)

Solution:Elastic collision $\rightarrow e = 1$ Inelastic collision $\rightarrow 0 < e < 1$ Explosion $\rightarrow$ Final kinetic energy is greater than initial kinetic energyPerfectly inelastic collision $\rightarrow e = 0$

(14) Answer : (4)

Solution:

Torque is equal to rate of change of angular momentum and moment of inertia depends on distribution of mass.

(15) Answer : (3)

Solution:

$$X = 2[\cos \pi t + \sin \pi t]$$

$$X = 2\sqrt{2} \sin\left(\pi t + \frac{\pi}{4}\right)$$

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

$$= 2\sqrt{2}\pi$$

(16) Answer : (1)

Solution:For $r < R$

$$F \propto r$$

For $r > R$

$$F \propto \frac{1}{r^2}$$

(17) Answer : (3)

Solution:

$$\lambda = \frac{h}{P}$$

$$P = \left(\frac{h}{\lambda} \right)$$

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

$$P = \frac{h\nu}{c}$$

(18) Answer : (4)

Solution:

$$f = \frac{3v}{2l}$$

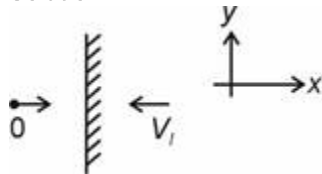
$$600 = \frac{3v}{2 \times \frac{1}{4}}$$

$$v = 200 \times \frac{1}{2}$$

$$= 100 \text{ m/s}$$

(19) Answer : (3)

Solution:



$$|\vec{v}_{IO} = \vec{v}_I - \vec{v}_O|$$

$$= (-4 - 4)$$

$$= -8\hat{i}$$

$$|\vec{v}_{IO}| = 8 \text{ km/h}$$

(20) Answer : (3)

Solution:

For interference two coherent waves are required

(21) Answer : (2)

Solution:

$$R \propto A^{\frac{1}{3}}$$

$$\frac{R_{Be}}{R_X} = \frac{(9)^{\frac{1}{3}}}{A^{\frac{1}{3}}}$$

$$A^{\frac{1}{3}} = 3 \times 9^{\frac{1}{3}}$$

$$A = 27 \times 9$$

$$= 243$$

(22) Answer : (1)

Solution:

$$Y = \overline{A+B+A+B}$$

$$= (\overline{A+B} \cdot \overline{A+B})$$

$$= \overline{A+B}$$

$$= A+B$$

(23) Answer : (4)

Solution:

$$\text{Mobility} = \frac{V_d}{E} = \frac{e\tau}{m}$$

Thus mobility is independent of electric field.

(24) Answer : (1)**Solution:**

$$\Delta K = -\Delta U = -\frac{1}{4\pi\epsilon_0} \left[\frac{Qq}{2r} - \frac{Qq}{r} \right]$$

$$K = \frac{1}{8\pi\epsilon_0} \frac{Qq}{r}$$

(25) Answer : (1)**Solution:**

$$e = -L \frac{di}{dt}$$

$$12 = L \frac{48}{60}$$

$$L = 15 \text{ Henry}$$

(26) Answer : (1)**Solution:**

Compare with

$$I = I_0 \sin(\omega t + \phi) = I_0 \sin \omega t \cos \phi + I_0 \cos \omega t \sin \phi$$

$$I_0 \cos \phi = 10, I_0 \sin \phi = 8$$

$$\tan \phi = \frac{8}{10} = \frac{4}{5}$$

$$\phi = \tan^{-1} \left(\frac{4}{5} \right)$$

(27) Answer : (2)**Hint:**

$$\phi_{total} = \frac{q_{enclosed}}{\epsilon_0}$$

Solution:

$$\phi_{total} = \phi_{in} + \phi_{out}$$

$$\phi_{in} = 0$$

$$\phi_{out} = 100 a^3 \cdot a^2$$

$$q_{enclosed} = 100 a^5 \epsilon_0$$

(28) Answer : (2)**Solution:**

$$E = hn$$

$$n_X > n_M > n_R$$

(29) Answer : (3)**Solution:**

$$\frac{\mu_0 I}{2\pi(6-x)} = \frac{\mu_0(2I)}{2\pi x}$$

$$x = 12 - 2x$$

$$x = 4 \text{ cm}$$

(30) Answer : (2)**Solution:**

Both spheres are identical therefore at equal potential, charge on the each sphere will be

$$q = \frac{q_1 + q_2}{2}$$

$$= \frac{-60e + 20e}{2}$$

$$= -20e$$

(31) Answer : (1)**Solution:**For intrinsic semiconductor $n_e = n_h$ **(32) Answer : (4)****Solution:**

$$\frac{hc}{\lambda} = E_1 - E_2$$

$$\lambda = \frac{hc}{E_1 - E_2}$$

(33) Answer : (3)**Solution:**

Volume of larger sphere = Total volume of smaller ones

$$\frac{4}{3}\pi R^3 = 64 \times \frac{4}{3}\pi r^3$$

$$R = 4r$$

$$C' = 4\pi\epsilon_0 R$$

$$C' = (4\pi\epsilon_0)4r$$

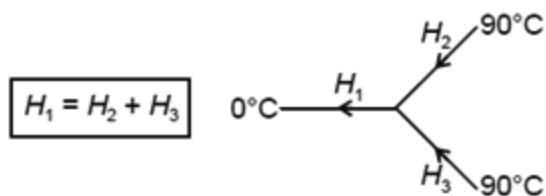
$$C' = 4C$$

(34) Answer : (1)**Solution:**

$$k_{\max} = h\nu - \phi \Rightarrow h\nu = \phi + k_{\max}$$

$$\frac{2}{3} = \frac{\phi+1}{\phi+4} \Rightarrow 2\phi+8 = 3\phi+3$$

$$\Rightarrow \phi = 5 \text{ eV}$$

(35) Answer : (1)**Solution:**

$$\frac{T}{R} = \frac{90-T}{R} + \frac{90-T}{R}$$

$$\Rightarrow 3T = 180$$

$$T = 60^\circ$$

(36) Answer : (3)**Solution:**

$$y = A \sin\left(\frac{2\pi t}{T}\right)$$

$$\frac{A}{\sqrt{2}} = A \sin\left(\frac{2\pi t}{T}\right)$$

$$\frac{\pi}{4} = \frac{2\pi t}{T}$$

$$t = \frac{T}{8}$$

(37) Answer : (3)**Solution:**

$$U = \frac{1}{2} \text{ stress} \times \text{strain}$$

$$= \frac{1}{2} Y \times \frac{\Delta L}{L} \times \frac{\Delta L}{L} = \frac{Y(\Delta L)^2}{2L^2}$$

(38) Answer : (3)**Solution:**Effective acceleration due to gravity = $g + a$ Pressure of liquid at depth $h = \rho h(g + a)$ **(39) Answer :** (3)**Solution:**

Breaking stress is the property of material of wire.

(40) Answer : (4)**Hint:**Slope of PV curve is $-\frac{\gamma P}{V}$.**Solution:**

$$\gamma_{\text{diatomic}} = \frac{7}{5} \text{ and } \gamma_{\text{monoatomic}} = \frac{5}{3}$$

So, magnitude of slope is greater for monoatomic gas.

(41) Answer : (4)**Solution:**

$$\bullet \quad x = \frac{t}{3}$$

$$v = \frac{dx}{dt} = \frac{1}{3}$$

$$a = \frac{dv}{dt} = 0$$

$$W = Fx$$

$$= 0 \quad (F = 0 \text{ since } a = 0)$$

(42) Answer : (1)

Solution:

Moment of inertia increases.

$$I \uparrow \Rightarrow \omega \downarrow$$

$$\text{As } \omega = \frac{2\pi}{T}, \text{ so } \omega \downarrow \Rightarrow T \uparrow$$

Length of day increases.

(43) Answer : (1)

Hint:

2-D motion under uniform acceleration.

Solution:

$$\vec{v} = \vec{u} + \vec{a}t$$

$$\vec{v} = (3\hat{i} + 8\hat{j}) + (2\hat{i} + 2\hat{j})t$$

$$\text{at } t = 3 \text{ s}$$

$$\vec{v} = (9\hat{i} + 14\hat{j}) \text{ m/s}$$

(44) Answer : (4)

Hint:

$$\vec{F}_{\text{net}} = m \vec{a}$$

since F is less than m_2g , hence m_1 will move towards right.

Solution:

$$\text{For block } m_1 : T - F = m_1 a \quad \dots(i)$$

$$\text{For block } m_2 : m_2g - T = m_2 a \quad \dots(ii)$$

On solving equation (i) and (ii)

$$a = \frac{m_2g}{2(m_1 + m_2)}$$

(45) Answer : (1)

Hint:

Use Bernoulli's Principle

Solution:

Since velocity increases down the streamline therefore area decreases. Water stream from tap become narrower.

CHEMISTRY

(46) Answer : (1)

Solution:

For minimum molecular mass one Fe atom should be present in the molecule.

$$\text{Minimum molecular mass} = \frac{56 \times 100}{0.1} = 56000 \text{ u}$$

(47) Answer : (4)

Solution:

$$1 \text{ gram of H}_2 \text{ has atoms} = \frac{1}{2} \times 2 \times N_A = N_A$$

$$1 \text{ gram of He has atoms} = \frac{N_A}{4}$$

$$1 \text{ gram of O}_3 \text{ has atoms} = \frac{1}{48} \times 3 \times N_A = \frac{1}{16} N_A$$

$$1 \text{ gram of P}_4 \text{ has atoms} = \frac{1}{124} \times 4 \times N_A = \frac{1}{31} N_A$$

(48) Answer : (1)

Solution:

$$\Delta E = 2.18 \times 10^{-18} \left(\frac{1}{1^2} - \frac{1}{3^2} \right) = 2.18 \times 10^{-18} \left(1 - \frac{1}{9} \right)$$

$$= -\frac{2.18 \times 10^{-18} \times 8}{9}$$

$$v = \frac{\Delta E}{h} = \frac{2.18 \times 10^{-18} \times 8}{9 \times 6.626 \times 10^{-34}} = 0.29 \times 10^{-18} \times 10^{34}$$

$$= 2.9 \times 10^{15} \text{ s}^{-1}$$

(49) Answer : (2)

Solution:

element Electronegativity value

S	2.5
P	2.1
N	3.0
O	3.5

(50) Answer : (4)

Solution:

Element Electron gain enthalpy (kJ mol^{-1})

O	-141
S	-200
Se	-195
Te	-190
Po	-174

(51) Answer : (1)

Solution:

$$\Delta S = nR \ln \frac{V_f}{V_i}$$

$$= 2.303 nR \log \frac{V_f}{V_i}$$

$$= 2.303 \times 2 \times 8.314 \times \log \frac{10}{1}$$

$$= 2.303 \times 2 \times 8.314$$

$$= 38.29 \text{ J/K}$$

(52) Answer : (3)

Solution:

$$\Delta H^\circ = \Delta U^\circ + \Delta n_g RT$$

$$= -10 + 0 \text{ (kJ)} = -10 \text{ kJ}$$

$$\Delta G^\circ = \Delta H^\circ + T \Delta S^\circ$$

$$= -10 - 298 \times (-50 \times 10^{-3})$$

$$= -10 + 14.9$$

$$= 4.9 \text{ kJ}$$

(53) Answer : (1)

Solution:

 $\text{SiF}_4 \rightarrow$ Tetrahedral $\text{SF}_4 \rightarrow$ Trigonal bipyramidal (See-saw shape)

(54) Answer : (4)

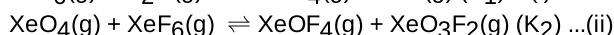
Solution:

Species Bond order

O_2^-	1.5	$\text{C}_2^{2-} \rightarrow 3$
He_2^+	0.5	$\text{NO} \rightarrow 2.5$

(55) Answer : (4)

Solution:



Required equation : (ii) – (i)

$$K = \frac{K_2}{K_1}$$

(56) Answer : (3)

Solution:Greater the K_{sp} , greater will be solubility. (For same type of salt)

(57) Answer : (4)

Solution:P has +5 oxidation state in PO_4^{3-} S has +6 oxidation state in SO_4^{2-} Cr has +6 oxidation state in $\text{Cr}_2\text{O}_7^{2-}$

(58) Answer : (2)

Solution: $\text{CO}_2(\text{s})$ is used as refrigerant C_{60} has 20 six membered ring and 12 five membered ring.

(59) Answer : (2)

Solution:

Stability of +1 oxidation state increases down the group in group 13.

(60) Answer : (1)

Solution:

IUPAC name:-

3-keto-2-methylhex-5-enal

(61) Answer : (1)

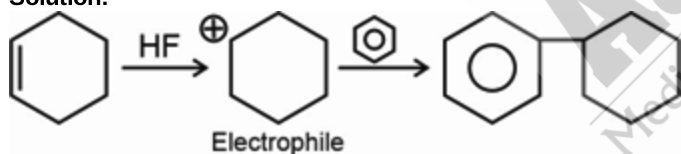
Solution: α -H must be present Bridged H does not participate in tautomerism.

(62) Answer : (3)

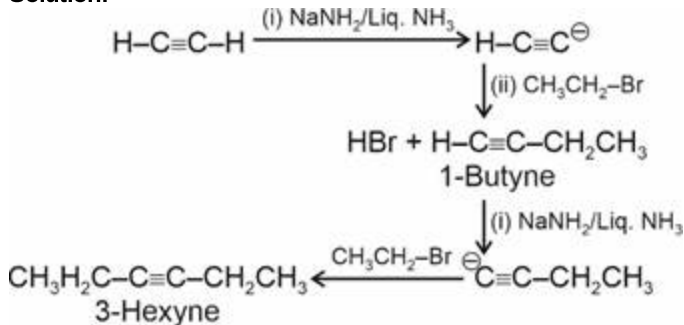
Solution:10 mL of 1 M H_2SO_4 = 20 mL of 1 M NH_3 Amount of N = $20 \times 10^{-3} \times 14$ % of N = $\frac{20 \times 10^{-3} \times 14 \times 100}{0.5}$ = $\frac{20 \times 14}{5}$

= 56%

(63) Answer : (3)

Solution:

(64) Answer : (4)

Solution:

(65) Answer : (4)

Solution: $(sp^3 \text{ C is present})$

is non-aromatic

(66) Answer : (4)

Hint:

Colligative properties depend only on number of solute particles and are independent of their chemical identity.

Solution:

Relative lowering of vapour pressure, depression of freezing point and osmotic pressure are colligative properties.

∴ Vapour pressure is not a colligative property.

(67) Answer : (3)

Solution:

Hint: $P_{total} = x_A P_A^o + x_B P_B^o$

Sol.: Mole fraction of A (x_A) = $\frac{4}{4+6} = \frac{2}{5}$

Mole fraction of B (x_B) = $\frac{6}{4+6} = \frac{3}{5}$

$$P_{total} = \frac{2}{5} \times 100 + \frac{3}{5} \times 140$$

$$= 40 + 84$$

$$= 124 \text{ torr}$$

(68) Answer : (3)

Solution:

$$\Lambda_m = \frac{1000 \times K}{C}$$

$$\Lambda_m = \frac{1000 \times 1.25 \times 10^{-3}}{0.25} = 5 \text{ S cm}^2 \text{ mol}^{-1}$$

(69) Answer : (3)

Solution:

$$\Lambda_m^\infty (\text{CH}_3\text{COOH})$$

$$= - (126.4) + (425.9) + (91.0)$$

$$= 390.5 \text{ S cm}^2 \text{ mol}^{-1}.$$

(70) Answer : (2)

Solution:

A catalyst catalyse only spontaneous reaction.

(71) Answer : (2)

Solution:

Arrhenius equation is $k = Ae^{-E_a/RT}$

Given, $k = Ae^{-1000}$

Comparing the two :

$$\frac{E_a}{RT} = 1000$$

$$E_a = \frac{1000 \times 2 \times 500}{1000} \left(R = \frac{2}{1000} \text{ k cal K}^{-1} \text{ mol}^{-1} \right)$$

$$E_a = 1000 \text{ k cal mol}^{-1}$$

(72) Answer : (4)

Solution:

Boiling point of H₂O is highest

(73) Answer : (2)

Hint:

In the Wacker's process, the oxidation of ethyne to ethanal is catalysed by PdCl₂.

Solution:

• Nickel catalyst enable the hydrogenation of fats.

• TiCl₄ with Al(CH₃)₃ forms the basis of the Ziegler catalyst used to manufacture polythene.

• Iron catalyst is used in the Haber's process for the production of ammonia from N₂ and H₂ mixture.

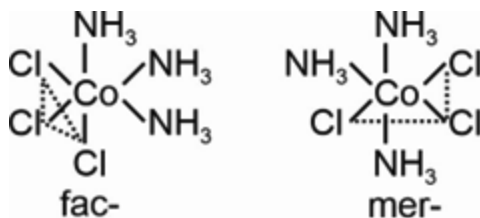
(74) Answer : (4)

Solution:

Interstitial compounds are chemically inert.

(75) Answer : (1)

Solution:



(76) Answer : (1)

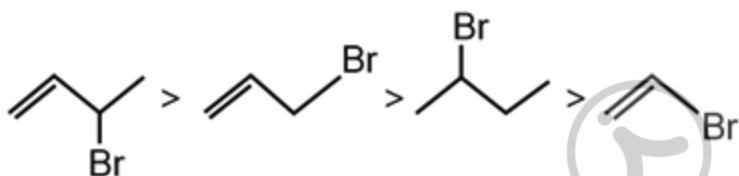
Solution:The M–C bond in metal carbonyl is possess both σ and π character.

(77) Answer : (2)

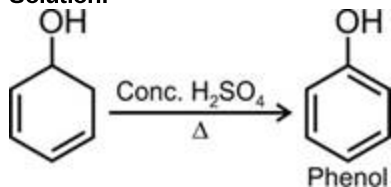
Solution:

A mixture containing two enantiomers in equal proportions will have zero optical rotation as rotation due to one isomer will be cancelled by the other.

(78) Answer : (1)

Solution:More stable is the carbocation, faster is S_N1 rate. Correct order of stability of the carbocation will beCorrect order of S_N1 rate will be

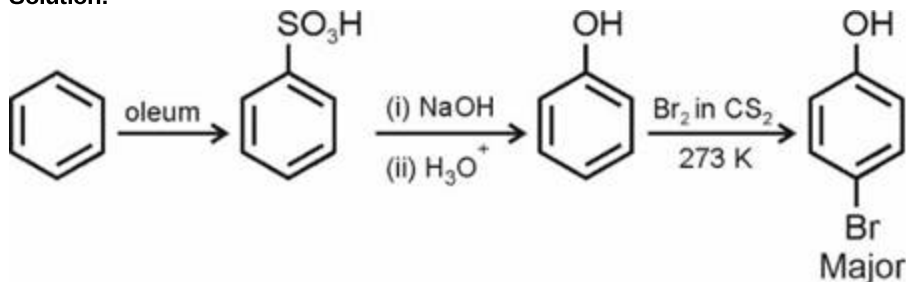
(79) Answer : (4)

Solution:

(80) Answer : (1)

Hint:

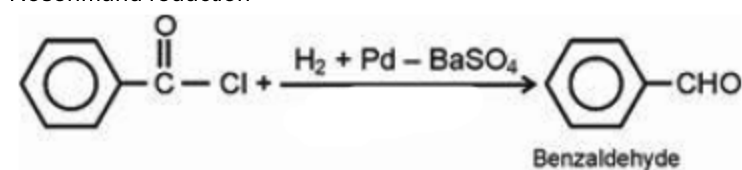
Benzene is sulphonated with oleum.

Solution:

(81) Answer : (4)

Solution:

Rosenmund reduction



(82) Answer : (2)

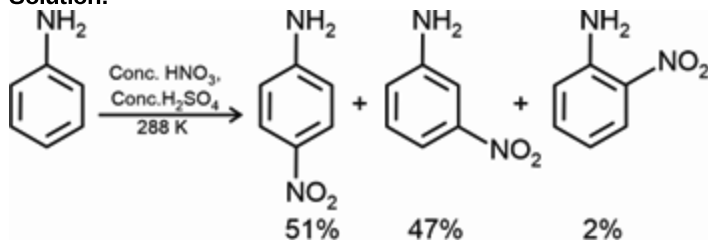
Solution:

During cannizzaro reaction, disproportionation of aldehydes takes place with conc. NaOH.

Aldehydes which do not have an α -hydrogen atom, undergo oxidation and reduction (disproportionation) reaction on heating with concentrated NaOH or KOH.

For example : Formaldehyde, benzaldehyde.

(83) Answer : (1)

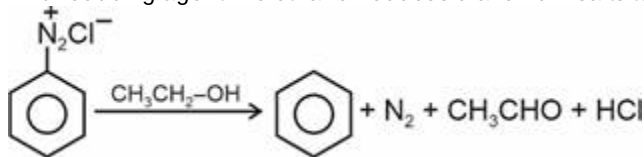
Solution:

Aniline is protonated to anilinium ion, which is meta-directing. Hence significant amount of meta-derivation is also formed.

(84) Answer : (3)

Solution:

Mild reducing agent like ethanol reduces diazonium salts to arenes and itself get oxidised to ethanal.



(85) Answer : (3)

Solution:

Guanine is a purine base.

(86) Answer : (3)

Hint:

Amylopectin is insoluble in water and constitutes about 80-85% of starch

Solution:

Amylopectin is a branched chain polymer of α -D-glucose units in which chain is formed by C1-C4 glycosidic linkage whereas branching occurs at C1-C6 glycosidic linkage.

(87) Answer : (2)

Solution:

Group reagent for precipitating group-V (Ba^{2+} , Sr^{2+} , Ca^{2+}) is $(\text{NH}_4)_2\text{CO}_3$ in presence of NH_4OH .

(88) Answer : (4)

Solution:

Phenolphthalein is colourless in acidic medium.

(89) Answer : (4)

Solution:

• NaCl is a salt of strong acid and strong base so its aq. solution will be neutral.

$$\text{pH} = \frac{\text{p}K_w}{2} = \frac{14}{2} = 7$$

• NH_4Cl is a salt of strong acid and weak base so its pH will be less than 7.

$$\text{pH} = \frac{1}{2} [\text{p}K_w - \text{p}K_b - \log C]$$

• CH_3COONa is a salt of strong base and weak acid so its pH will be more than 7.

$$\text{pH} = \frac{1}{2} [\text{p}K_w + \text{p}K_a + \log C]$$

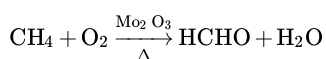
• NH_4CN is a salt of weak acid and weak base and pH of its aq. solution will be independent of concentration of salt.

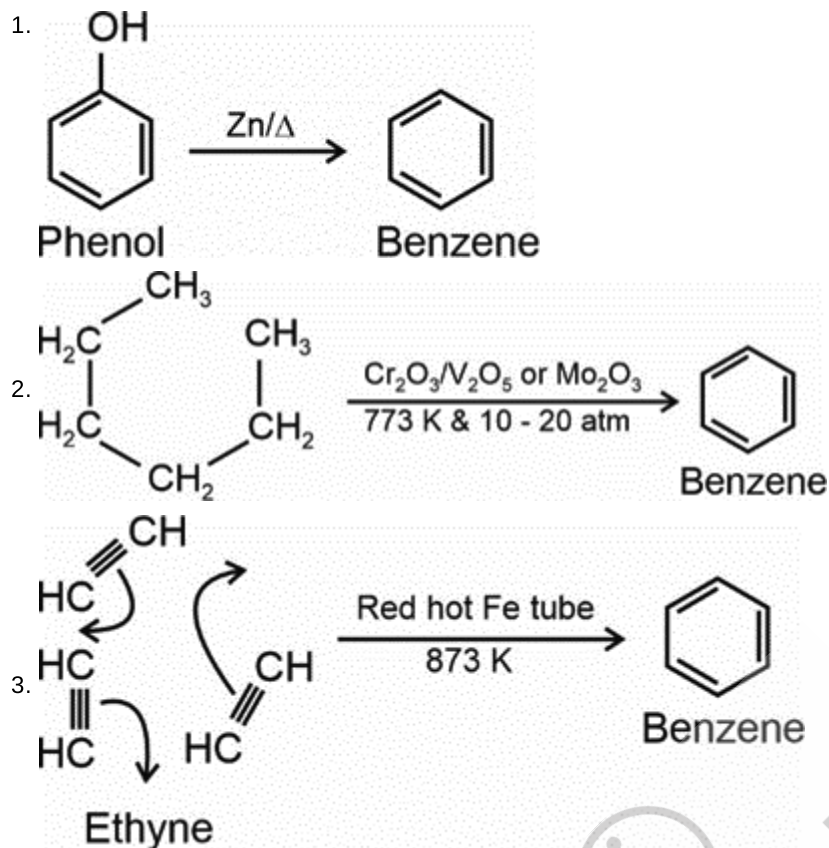
$$\text{pH} = \frac{1}{2} [\text{p}K_w + \text{p}K_a - \text{p}K_b]$$

(90) Answer : (3)

Hint:

Controlled oxidation of methane can form various compounds with different conditions and catalysts.

**Solution:**



BIOLOGY

(91) Answer : (3)

Solution:

Genus is a group of related species which has more characters in common in comparison to species of other genera.

(92) Answer : (1)

Solution:

Five kingdom classification was given by R.H. Whittaker. Protista, fungi and animalia show heterotrophic mode of nutrition with eukaryotic cell type.

(93) Answer : (3)

Solution:

Viroids are the smallest self replicating particles which were discovered by T.O. Diener.

(94) Answer : (3)

Solution:

In members of rhodophyceae, the stored food is floridean starch and it is very similar to amylopectin and glycogen in structure.

(95) Answer : (2)

Solution:

Mustard is an example of actinomorphic flower

(96) Answer : (1)

Solution:

Inferior ovary is present in guava. The given flower has superior ovary.

(97) Answer : (4)

Solution:

Monocot stem has sclerenchymatous hypodermis. Mesophyll is not differentiated in monocot leaf.

(98) Answer : (1)

Solution:

Open vascular bundle is present in dicot stem.

(99) Answer : (4)

Solution:

The sub-metacentric chromosome has centromere slightly away from the middle of the chromosome resulting into one shorter arm and one longer arm.

(100) Answer : (4)

Solution:

Meiosis increases the genetic variability in the population of organisms from one generation to the next.

(101) Answer : (1)

Solution:

In animal cells, during 'S' phase, DNA replication begins in the nucleus and the centriole duplicates in the cytoplasm.

(102) Answer : (2)

Solution:

Ingenhousz showed that only green part of the plants could release oxygen.

(103) Answer : (3)

Solution:



(104) Answer : (4)

Solution:

Cytokinin promotes nutrient mobilisation thereby, helping in delay of leaf senescence and overcoming apical dominance.

(105) Answer : (2)

Solution:

Unisexual flowers present on same plant prevents autogamy but not geitonogamy.

(106) Answer : (4)

Solution:

The columnar epithelium is composed of a single layer of tall and slender cells. Their nuclei are located at the base. Free surface may have microvilli. They are found in the lining of stomach and intestine and help in secretion and absorption.

(107) Answer : (4)

Solution:

Male cockroaches bear a pair of short, thread-like anal style which are absent in females. In both sexes, the 10th segment bears a pair of jointed filamentous structures called anal cerci.

(108) Answer : (3)

Solution:

Proteins constitute 10-15% of the total cellular mass. Inulin is a homopolysaccharide. Collagen is the most abundant protein in the animal world and Ribulose biphosphate Carboxylase-Oxygenase (RuBisCO) is the most abundant protein in the whole of the biosphere.

(109) Answer : (2)

Solution:

Inspiration is initiated by the contraction of diaphragm which increases the volume of thoracic chamber in the antero-posterior axis.

During forced expiration, there is relaxation of diaphragm and external inter-costal muscles.

(110) Answer : (3)

Solution:

A unique vascular connection exists between the digestive tract and liver called hepatic portal system. The hepatic portal vein carries blood from intestine to the liver before it is delivered to the systemic circulation.

(111) Answer : (4)

Solution:

Liver, the largest gland in human body, secretes bile-containing substances like bilirubin, biliverdin, cholesterol, degraded steroid hormones, vitamins and drugs. Most of these substances ultimately pass out alongwith digestive wastes. Sebaceous glands eliminate certain substances like sterols, hydrocarbons and waxes through sebum.

(112) Answer : (1)

Solution:

The facial region is made up of 14 skeletal elements which form the front part of the skull. The total number of phalanges in one forelimb of an adult man is 14.

Total number of thoracic vertebrae is 12. We have 12 pairs of ribs.

(113) Answer : (3)

Hint:

Identify a commensal bacteria in human gut.

Solution:

E. histolytica causes amoebiasis.

Enterobius is pinworm.

(114) Answer : (4)

Solution:

Underproduction of hormones by the adrenal cortex alters carbohydrate metabolism causing acute weakness and fatigue leading to a disease called Addison's disease.

(115) Answer : (2)

Solution:

The adult echinoderms are radially symmetrical but their larvae are bilaterally symmetrical. *Aplysia* is a mollusc and *Anopheles* is an arthropod.

(116) Answer : (4)

Solution:

Constricted pod shape is recessive trait which always express in homozygous condition only.

(117) Answer : (1)

Solution:

AA + XO – Grasshopper

AA + XY – *Drosophila*

AA + ZW – Birds

AA + ZO – Butterfly

(118) Answer : (3)

Solution:

Less than 2 percent of the human genome codes for proteins.

(119) Answer : (3)

Solution:

Ladybird, a beetle with red and black markings, is useful in controlling aphids.

(120) Answer : (3)

Solution:

The maximum number of individuals of a population which can be supported with optimum resources for their survival is called carrying capacity.

(121) Answer : (2)

Solution:

Species composition and stratification are the structural component of an ecosystem.

Sugarcane field and coral reefs are most productive ecosystem.

(122) Answer : (3)

Solution:

In *lac* operon

z gene codes for β -galactosidase

y gene codes for Permease

a gene codes for Transacetylase

(123) Answer : (4)

Solution:

Helicase unwind DNA helix during replication.

(124) Answer : (4)

Solution:

Plants of family Solanaceae have exstipulate leaves and swollen placenta with many ovules.

(125) Answer : (3)

Solution:

In fluid mosaic model, proteins float in the lipid bilayer as ice bergs.

(126) Answer : (2)

Solution:

Carboxylation is the most crucial step of the Calvin cycle.

(127) Answer : (2)

Solution:

In telophase stage decondensation of chromosome occurs.

(128) Answer : (2)

Hint:

Down's syndrome is a chromosomal disorder

Solution:

It arises due to non-disjunction of chromosomes. The affected person has 45 + XX or 45 + XY genotype.

(129) Answer : (4)

Solution:

DNA fingerprinting technique involve following step.

- Isolation of DNA
- Digestion of DNA by endonuclease
- Electrophoresis
- Southern blotting
- Hybridisation with radioactively labelled probe
- Autoradiography

(130) Answer : (4)

Solution:

Under unfavourable conditions, many zooplanktons shows a stage of suspended development called diapause.

(131) Answer : (2)

Solution:

During the menstrual cycle, the menstrual phase is followed by the proliferative phase. During this phase, the primary follicle in the ovary grow to become a fully mature Graafian follicle and simultaneously the endometrium of uterus regenerates through proliferation. These changes in the ovary and the uterus are induced by changes in the levels of pituitary and ovarian hormones.

(132) Answer : (3)

Hint:

Mature bone cells present in lacunae.

Solution:

Cartilage forming cells are chondrocytes. Bone forming cells are called osteocytes. Fibroblasts are main cells of connective tissues responsible for synthesis of connective tissue fibres and matrix. Immature cartilage cells are called chondroblasts.

(133) Answer : (4)

Solution:

Zosterophyllum gave rise to herbaceous lycopods and arborescent lycopods.

(134) Answer : (3)

Solution:

Bacteria like *Streptococcus pneumoniae* and *Haemophilus influenzae* are responsible for the disease pneumonia in humans which infects the alveoli (air-filled sacs) of the lungs. As a result of the infection, the alveoli get filled with fluid leading to severe problems in respiration.

(135) Answer : (1)

Solution:

Unless one cuts the vector DNA and the source DNA with the same restriction enzymes, the recombinant vector molecule cannot be created. When cut by the same restriction enzymes, the resultant DNA fragments have the same kind of 'sticky-ends' and these can be joined together (end-to-end) using DNA ligases.

(136) Answer : (4)

Solution:

The process of childbirth is called parturition which is induced by a complex neuroendocrine mechanism involving cortisol, estrogen and oxytocin.

(137) Answer : (4)

Solution:

Humans do not possess nucleated RBCs and renal portal system. Frogs lack pons.

(138) Answer : (3)

Solution:

Plasma is a straw coloured, viscous fluid constituting nearly 55 per cent of the blood. 90-92 per cent of plasma is water and proteins contribute 6-8 per cent of it. Monocytes contribute 6-8% of the total WBCs. Monocytes are agranulocytes.

(139) Answer : (2)**Solution:**

Total volume of air accommodated in the lungs at the end of a forced inspiration is called total lung capacity. It includes RV + ERV + TV + IRV.

EC = TV + ERV; IC = TV + IRV; FRC = ERV + RV

(140) Answer : (3)**Solution:**

The given figure is of *Petromyzon* which belongs to the class Cyclostomata. Cyclostomes have a sucking and circular mouth without jaws. Their body is devoid of scales and paired fins. Cranium and vertebral column are cartilaginous.

Circulation is of closed type. Cyclostomes are marine but migrate for spawning to fresh water.

(141) Answer : (1)**Solution:**

The fluid entering the proximal tubule of the nephron, known as the glomerular filtrate, has an osmolarity similar to that of the plasma. Subsequent reabsorption and secretion processes in the renal tubules contribute to alternations in the composition and osmolarity of the urine.

(142) Answer : (4)**Solution:**

Primary metabolites have identifiable functions and play known roles in normal physiological processes. We do not at the moment, understand the role or functions of all the 'secondary metabolites' in host organisms. However, many of them are useful to 'human welfare' (e.g., rubber, drugs, spices, scents and pigments).

(143) Answer : (1)**Solution:**

Fibrous joints do not allow any movement. This type of joint is present between the flat skull bones. Pivot joint is present between atlas and axis while gliding joint is present between the carpals and saddle joint is present between carpal and metacarpal of thumb.

(144) Answer : (2)**Solution:**

The P-wave of a standard ECG represents electrical excitation of the atria. Volume of blood pumped out by each ventricle per minute is called cardiac output.

(145) Answer : (4)**Solution:**

Isolation of DNA from an organism and its further introduction into host cell is included in upstream processing.

(146) Answer : (1)**Solution:**

Labeo, *Catla* and *Clarias* belong to class Osteichthyes. They contain gill cover / operculum on each side of gills.

Pristis belongs to class Chondrichthyes. It lacks gill cover or operculum.

(147) Answer : (2)**Hint:**

Structure that secretes erythropoietin in humans

Solution:

Male reproductive organs in frogs consist of a pair of yellowish ovoid testes, which are found adhered to the upper part of kidneys by a double fold of peritoneum called mesorchium.

(148) Answer : (4)**Solution:**

Chorionic villi appears on trophoblast which interdigitates with uterine tissue to form the placenta in humans.

(149) Answer : (2)**Hint:**

Use of progestogens or estrogen-progestogen combination is employed

Solution:

Progestogens alone or in combination with estrogen can be used by females as injections or implants under the skin. Their mode of action is similar to that of steroidal pills and their effective periods are much longer.

Lippes loop is a non-medicated IUD.

Cervical caps are made of rubber and are used as barriers.

(150) Answer : (4)**Solution:**

According to the connotations of the theory of special creation, the Earth is about 4000 years old.

(151) Answer : (3)**Hint:**

Insulin is secreted by β -cells of islets of Langerhans of the pancreas.

Solution:

Earlier, insulin was extracted from pancreas of slaughtered cattle and pigs. But the insulin obtained from animal source caused allergy in some patients or other types of reactions to the foreign protein.

(152) Answer : (1)

Hint:

Exclude nematode

Solution:

Bt toxin genes are isolated from *Bacillus thuringiensis* and incorporated into several crop plants such as cotton. The protein encoded by the genes *cryIAc* and *cryIIAb* control cotton bollworms, that of *cryIAb* control corn borers.

(153) Answer : (3)

Hint:

These molecules are employed in autoradiography.

Solution:

Probes are allowed to hybridise to its complementary DNA in a clone of cells followed by detection using autoradiography.

(154) Answer : (2)

Solution:

Rhythm method is also called periodic abstinence. As no medicines or devices are used in natural methods of contraception, their side-effects are almost nil. Chances of failure in these methods are high.

(155) Answer : (4)

Solution:

Australian marsupials and placental mammals show convergent evolution.

(156) Answer : (2)

Solution:

Pyramid of number for tree ecosystem can be inverted or spindle shaped.

(157) Answer : (3)

Solution:

A single species might show high diversity at the genetic level.

(158) Answer : (2)

Solution:

- a - Fishes
- b - Mammals
- c - Amphibians
- d - Reptiles
- e - Birds

(159) Answer : (4)

Solution:

Mycoplasma lack cell wall and they can survive without oxygen. They are pathogenic to both plants and animals.

(160) Answer : (1)

Solution:

Basal placentation : Sunflower

Axile placentation : China rose

Parietal placentation : Mustard

Free central placentation : *Dianthus*

(161) Answer : (2)

Solution:

In a dicot root, number of vascular bundles may be 2-4 but in a monocot root, more than 6 vascular bundles are found.

(162) Answer : (1)

Hint:

Function of ER and Golgi apparatus is co-ordinated.

Solution:

Materials to be packaged in the form of vesicles from the ER fuse with *cis* face of the Golgi apparatus and move towards the maturing face. This explains, why the Golgi apparatus remains in close association with the ER.

(163) Answer : (3)

Solution:

In mitochondria, ETS occurs in inner membrane. During electron transport, protons accumulate in the perimitochondrial space / inter membrane space.

(164) Answer : (3)

Solution:

ABA is a stress hormone and a derivative of carotenoids.

(165) Answer : (4)

Solution:

Function of filiform apparatus is to guide the entry of pollen tube into the synergids.

(166) Answer : (2)

Hint:

Members of Fabaceae have 10 stamens in a flower.

Solution:

Diadelphous condition of fabaceae is shown by $A(9) + 1$.

(167) Answer : (3)

Hint:

The fimbriae are small bristle-like fibres in bacteria that help in attaching to the host tissue.

Solution:

Chromatophores are membranous structures containing photosynthetic pigments. Plasmid is small circular DNA that provide certain phenotypic character such as resistant to antibiotics to such bacteria. Gas vacuoles provide buoyancy

(168) Answer : (1)

Solution:

Prophase is short and without substages. Prophase-I lacks splitting of centromere. Prophase I have crossing over phenomenon.

(169) Answer : (2)

Solution:

PEN is primary endosperm nucleus. It is the result of triple fusion, among one male gamete and two polar nuclei.

(170) Answer : (4)

Solution:

In gymnosperms and angiosperms, multicellular female gametophyte is retained within the megasporangium.

(171) Answer : (2)

Solution:

Cocaine is a stimulant. Tobacco contains an alkaloid named nicotine that stimulates the adrenal gland to release adrenaline and nor adrenaline.

(172) Answer : (3)

Solution:

Chitin is a structural homopolysaccharide of N-acetylglucosamine linked by β -1,4 glycosidic bond.

(173) Answer : (4)

Solution:

Muscular dystrophy is a genetic disease characterised by progressive degeneration of skeletal muscle.

(174) Answer : (1)

Hint:

Here, X is O_2 .

Solution:

100 mL of oxygenated blood can deliver 5 mL of O_2 to tissues. Changes in concentration of CO_2 is recognised by chemoreceptors present in aortic arch and carotid body.

(175) Answer : (3)

Hint:

Histamine is a vasodilator.

Solution:

Dialysing unit contains a coiled cellophane tube surrounded by dialysing fluid having same composition as that of blood plasma except nitrogenous wastes.

This method is a boon for thousands of uremic patients all over the world.

(176) Answer : (2)

Solution:

At rest, the membrane is more permeable to K^+ and nearly impermeable to Na^+ .

(177) Answer : (4)

Solution:

Testosterone is a steroid hormone that acts via intracellular receptors and does not generate second messengers.

(178) Answer : (4)

Hint:

Coelomate animals.

Solution:

The body cavity lined by mesoderm is called coelom. Animals possessing coelom are called coelomates *e.g.* annelids, molluscs, arthropods, echinoderms, hemichordates and chordates. Water vascular system is a distinctive feature of echinoderms. The adult echinoderms are radially symmetrical animals. *Balanoglossus* and *Sepia* show bilateral symmetry.

(179) Answer : (4)

Solution:

Nerve impulses are always transmitted across a synapse from axon to cell body and delay in this transmission at each synapse is called synaptic delay.

(180) Answer : (3)

Solution:

Enzymes isolated from organisms who normally live under extremely high temperatures are stable and retain their catalytic power even at high temperatures (up to 80°-90°C).

The active site of enzyme breaks the chemical bonds of substrate and forms a new enzyme-product-complex.

