Aakash
Medical|IIT-JEE|Foundations

Corporate Office : Aakash Tower, 8, Pusa Road, New Delhi-110005, *Ph.*011-47623456

MM : 720

Fortnightly Test Series 2024-25_RM(P4)-Test-01D

Time : 200 Min.

PHYSICS

SECTION-A

1.	(1)	**19.**	(2)
2.	(3)	**20.**	(1)
3.	(2)	**21.**	(4)
4.	(4)	**22.**	(2)
5.	(1)	**23.**	(1)
6.	(4)	**24.**	(1)
7.	(3)	**25.**	(3)
8.	(2)	**26.**	(4)
9.	(3)	**27.**	(2)
10.	(3)	**28.**	(3)
11.	(3)	**29.**	(4)
12.	(4)	**30.**	(4)
13.	(2)	**31.**	(1)
14.	(2)	**32.**	(2)
15.	(4)	**33.**	(2)
16.	(2)	**34.**	(3)
17.	(1)	**35.**	(1)
18.	(4)		

SECTION-B

36.	(2)	**44.**	(1)
37.	(4)	**45.**	(2)
38.	(2)	**46.**	(3)
39.	(2)	**47.**	(2)
40.	(2)	**48.**	(1)
41.	(3)	**49.**	(4)
42.	(1)	**50.**	(1)
43.	(4)		

CHEMISTRY

SECTION-A

51.	(1)	**69.**	(4)
52.	(1)	**70.**	(2)
53.	(3)	**71.**	(3)
54.	(1)	**72.**	(3)
55.	(3)	**73.**	(3)
56.	(2)	**74.**	(1)
57.	(2)	**75.**	(1)
58.	(2)	**76.**	(2)
59.	(3)	**77.**	(2)
60.	(1)	**78.**	(4)
61.	(2)	**79.**	(2)
62.	(2)	**80.**	(3)
63.	(2)	**81.**	(2)
64.	(1)	**82.**	(3)
65.	(3)	**83.**	(4)
66.	(2)	**84.**	(3)
67.	(3)	**85.**	(4)
68.	(2)		

NEETXRT
BY RIYANSH TORAWAT

SECTION-B

86.	(2)	**94.**	(2)
87.	(3)	**95.**	(1)
88.	(3)	**96.**	(2)
89.	(1)	**97.**	(3)
90.	(4)	**98.**	(3)
91.	(4)	**99.**	(3)
92.	(2)	**100.**	(4)
93.	(4)		

BOTANY

SECTION-A

101.	(2)	**119.**	(3)
102.	(3)	**120.**	(3)
103.	(2)	**121.**	(3)
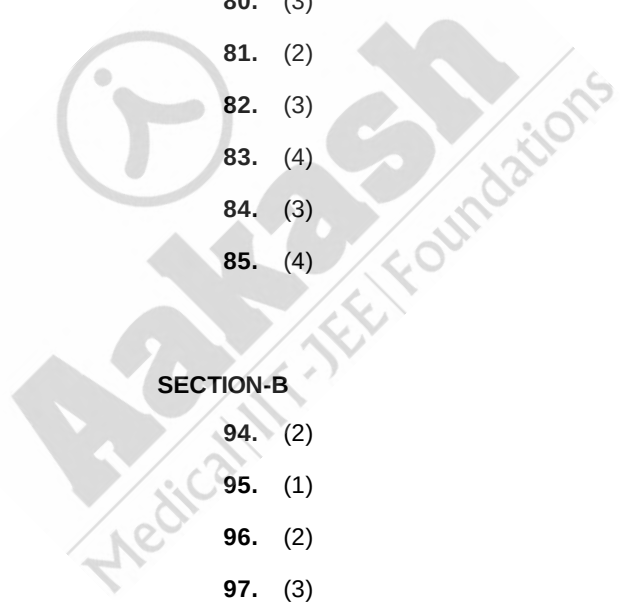
104. (4)

105. (4)

106. (3)

107. (1)

108. (2)

109. (4)

110. (2)

111. (3)

112. (4)

113. (3)

114. (1)

115. (4)

116. (4)

117. (3)

118. (1)

122. (1)

123. (1)

124. (3)

125. (4)

126. (3)

127. (3)

128. (2)

129. (4)

130. (3)

131. (2)

132. (1)

133. (2)

134. (1)

135. (2)

NEETXRT
BY RIYANSH TORAWAT

SECTION-B

136. (4)

137. (1)

138. (4)

139. (1)

140. (2)

141. (2)

142. (2)

143. (3)

144. (4)

145. (2)

146. (3)

147. (4)

148. (3)

149. (3)

150. (3)

ZOOLOGY

SECTION-A

151. (2)

152. (3)

153. (3)

154. (4)

155. (2)

156. (2)

157. (1)

158. (2)

159. (2)

160. (3)

169. (3)

170. (2)

171. (1)

172. (1)

173. (2)

174. (2)

175. (2)

176. (2)

177. (2)

178. (1)

161. (2)		**179.** (2)	
162. (1)		**180.** (3)	
163. (4)		**181.** (3)	
164. (4)		**182.** (4)	
165. (1)		**183.** (3)	
166. (3)		**184.** (1)	
167. (3)		**185.** (4)	
168. (1)			

SECTION-B

186. (2)	**194.** (1)
187. (1)	**195.** (2)
188. (3)	**196.** (2)
189. (2)	**197.** (3)
190. (3)	**198.** (1)
191. (2)	**199.** (1)
192. (4)	**200.** (2)
193. (3)	

NEETXRT
BY RIYANSH TORAWAT

Hints and Solutions

PHYSICS

SECTION-A

(1) Answer : (1)
Solution:
Total displacement is zero
$V_{avg} = \frac{0}{8} = 0$

(2) Answer : (3)
Solution:
$v_{rel} = u_{rel} + a_{rel}\, t$
$= u + 0 = u$

(3) Answer : (2)
Solution:
Since |displacement| $\leq$ distance
therefore |average velocity| $\leq$ average speed
average velocity is a vector quantity.

(4) Answer : (4)
Solution:
a = slope of v-t graph

(5) Answer : (1)
Solution:
$T_1 - T_2 = 10$
$\Delta T = \pm (\Delta T_1 + \Delta T_2)$
$\Rightarrow (10.0 \pm 0.5)\,°C$

(6) Answer : (4)
Solution:
$y = ML^{-1}T^{-1}$
$\frac{\Delta y}{y} \times 100 = \frac{\Delta M}{M} \times 100 + \frac{\Delta L}{L} \times 100 + \frac{\Delta T}{T} \times 100$
$= 1 + 1.5 + 3$
$= 5.5\,\%.$

(7) Answer : (3)
Solution:
At the same time two values of distance are not possible.

(8) Answer : (2)
Solution:
Error = 0.1 + 0.1 = 0.2 and $x - y = 5.0 \pm 0.2$

(9) Answer : (3)
Solution:
$v_{ev} = \frac{20+30}{5+3} = \frac{50}{8} = 6.25 \text{ m/s}$

(10) Answer : (3)
Solution:
$y = 6t - 5t^2$
$\Rightarrow v = 6 - 10t$
at $t = \frac{6}{10}$; $v = 0$

(11) Answer : (3)
Solution:
Δv = Area
$v_{final} - 0 = \frac{1}{2} \times 20 \times 20$
$v_{final} = v_{max} = 200 \text{ m/s}$

(12) Answer : (4)
Solution:

$\frac{\Delta x}{x} = \frac{\Delta A}{A} + 3\frac{\Delta B}{B} + 2\frac{\Delta C}{C} = 1.5\%$

(13) Answer : (2)
Solution:
Slope of position-time graph is called velocity.

(14) Answer : (2)
Solution:
Least count = 1 M.S.D – 1 V.S.D

$\frac{n\,\text{N} - n\,\text{N} + \text{N}}{n} = \frac{\text{N}}{n}$ cm

(15) Answer : (4)
Solution:
$a = \frac{dv}{dt}$

$\int_{v_0}^{v} dv = \int_0^t a\,dt = \int_0^t bt\,dt$

$(v - v_0) = \frac{bt^2}{2}$

$\therefore\ v = v_0 + \frac{bt^2}{2}$

(16) Answer : (2)
Solution:
Time of flight $T = t_1 + t_2$

$T = \frac{2u}{g}$

$\frac{2u}{g} = t_1 + t_2$

$\frac{2u}{g} = 4 + 6$

u = 50 m/s

(17) Answer : (1)
Solution:
Area of $a - t$ graph = change in velocity
Area of $a - t$ graph = $\Delta v = \frac{1}{2}[2 \times 4] + [1 \times 4] - [4 \times 1]$ $\Delta v = v_f - v_i$ = 4 m/s

$4 = 20 - v_i$

$\therefore\ v_i = 20 - 4 = 16$ m/s

(18) Answer : (4)
Solution:
$0^2 - 30^2 = 2(a) \times 10 \to (1)$
$0^2 - 60^2 = 2(a) \times S_2 \to (2)$
(2) / (1) $\Rightarrow S_2 = 40$ m

(19) Answer : (2)
Solution:
$R_{net} = R_1 + R_2$
$\Delta R_{net} = \Delta R_1 + \Delta R_2$
$\Rightarrow R_{net} = (20 + 40) \pm (0.2 + 0.2)$
= (60 ± 0.4) Ω

(20) Answer : (1)
Hint:
Addition of significant figures.
Solution:
(0.307 + 0.52 + 0.4) g = 1.227 g
As answer should have one decimal number
$\therefore$ 1.2 g

(21) Answer : (4)
Solution:
$h = \frac{1}{2}gt^2$

$\frac{h_1}{h_2} = \frac{1}{4} = 0.25$

(22) Answer : (2)
Solution:
In multiplication the result have as many significant figures retained, as there in the original number with the least significant figures.

(23) Answer : (1)
Solution:

$$V_{av} = \frac{\int_0^3 v\,dt}{3}$$

$$= \frac{\int_0^3 9t^2\,dt}{3} = \frac{9\left[\frac{t^3}{3}\right]_0^3}{3} = 27 \text{ m/s}$$

(24) Answer : (1)
Solution:
The closeness to real value is most accurate, 4.9 cm reading is very close to 5 cm.

(25) Answer : (3)
Solution:
Displacement during motion = area of *v-t* graph with sign
$s = (4 \times 2) + (-4 \times 2) + (4 \times 2) = 8$ m and distance without sign
$d = (4 \times 2) + (4 \times 2) + (4 \times 2) = 24$ m
$\therefore \frac{s}{d} = \frac{8}{24} = \frac{1}{3}$

(26) Answer : (4)
Solution:
LC = 1 MSD – 1 VSD
Now, 19 MSD = 20 VSD
$\therefore \quad 1 \text{ VSD} = \frac{19}{20}\text{MSD}$
$\therefore \quad LC = \left(1 - \frac{19}{20}\right) \text{ mm}$
$= \frac{1}{20} \text{ mm}$
$= \frac{1000}{20} \, \mu m$
$= 50 \, \mu m$

(27) Answer : (2)
Solution:
$x_A = 2t^2 - 4t$
$\therefore v_A = 4t - 4$
At $t = 4$
$v_A = 12$ m/s
$x_B = t^3 - 2t$
$\therefore v_B = 3t^2 - 2$
At $t = 4$
$v_B = 46$ m/s
$\therefore v_{BA} = 46 - 12 = 34$ m/s

(28) Answer : (3)
Solution:
As $v^2 = u^2 + 2as$
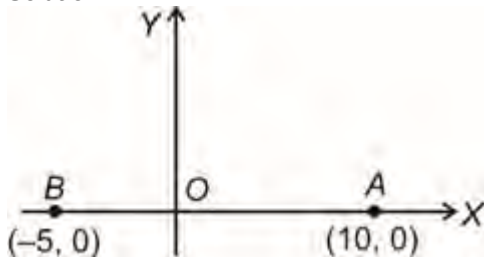$\therefore v^2 = 30^2 + 2 \times (10) \times (35)$
$= 900 + 700$
$\therefore \quad v^2 = 1600$
$\therefore v = +40 \text{ m/s}$

(29) Answer : (4)
Solution:

$$\left[\mathsf{T}\right] = \left[\frac{F}{L}\right] = \left[\frac{E}{L^2}\right] = \left[\frac{E}{(VT)^2}\right]$$

(30) Answer : (4)
Solution:

Particle moves from O to A then from A to B

Distance = 10 + 10 + 5 = 25 m

(31) Answer : (1)

Solution:

$S_1 = \frac{1}{2}a(5)^2 = \frac{a}{2}(25)$

$S_2 = \frac{1}{2}a(10)^2 = \frac{a}{2}(100)$

$\frac{s_2}{s_1} = \frac{100}{25} = 4$

(32) Answer : (2)

Solution:

$s_{nel} = 300 + 1700 = 2000$ m

$v_{rel} = 90 \times \frac{5}{18} = 25$ m/s

$t = \frac{s_{ret}}{v_{rel}} = \frac{2000}{25} = 80$ s

(33) Answer : (2)

Solution:

$x = 8 + 12t - t^3$

$v = 12 - 3t^2 = 0 \quad \therefore t = 2$ s

$a = -6t = -12$

$\therefore$ Retardation 12 m/s^2

(34) Answer : (3)

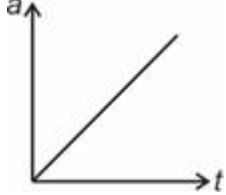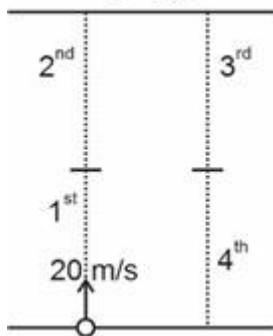**Solution:**

$x = 3t^3 - 6t$

$v = 9t^2 - 6$

$a = 18t$

(35) Answer : (1)

Solution:

Distance covered in 4th second = distance covered in 1st second.

$S_n = u + \frac{a}{2}(2n - 1)$

$S = 20 - \frac{10}{2}(2 \times 1 - 1) = 15$ m

SECTION-B

(36) Answer : (2)

Solution:

For uniformly accelerated motion in straight line

$v_{avg} = \frac{u+v}{2}$

$v_{avg} = \frac{0+(0+at)}{2} = \frac{at}{2}$

(37) Answer : (4)
Solution:
On return journey
$v^2 = u^2 + 2g\frac{h}{2}$
$100 = 0 + 2 \times \frac{10 \times h}{2}$
h = 10 m

(38) Answer : (2)
Solution:
at $t = 0$, $x = 4$ m
at $t = 2$ s, $x = 0$ m
at $t = 4$ s, $x = -12$ m
Distance travelled = |4 – (– 12) |
= 16 m

(39) Answer : (2)
Hint:
Dimensions of energy.
Solution:
KE is energy
E = Force x displacement
= [MLT^{-2}] × [L]
= [ML^{2}T^{-2}]

(40) Answer : (2)
Solution:
As every term in the equation must represent the same quantity
Dimensionally x = at
a = $\frac{x}{t} = \frac{L}{T} = LT^{-1}$

(41) Answer : (3)
Hint:
Principle of homogeneity.
Solution:
According to principle of homogeneity, only similar physical quantities can be added or subtracted, so $\frac{P-R}{Q}$ is not

possible.

(42) Answer : (1)
Solution:
$x = 2t - 5t^2 + t^3$
$v = 2 - 10t + 3t^2$
$v(t = 0) = 2$ m/s

(43) Answer : (4)
Solution:
NU constant
$N = \frac{k}{U}$
as U increases N decreases and its vice versa
Therefore, the shape of graph is a rectangular hyperbola.

(44) Answer : (1)
Solution:
Significant zeroes in 0.0023 → Zero
1100100 → Two
2.003 → Two
Leading zeroes are not significant. Trailing zeroes without decimal are not significant.

(45) Answer : (2)
Solution:
$W = \frac{A+x}{B}$
By principle of homogeneity
$A = [L]$

$B = \frac{\text{length}}{W}$
$\therefore \frac{A}{B} = W = \left[M L^2 T^{-2} \right]$

(46) Answer : (3)
Solution:

$\rho = \frac{m}{v} = \frac{m}{L^3}$

$\frac{\Delta p}{f} = \frac{\Delta m}{m} + \frac{3\Delta L}{L}$

= 3% + 3 × 2% = 9%

(47) Answer : (2)
Solution:
A quantity without a unit always has zero dimensions although a quantity with a unit may or may not have dimensions.

(48) Answer : (1)
Solution:
$v^2 = u^2 + 2as$

Stopping distance = $s = \frac{u^2}{2a}$

(49) Answer : (4)
Solution:
$V_{av} = \dfrac{3S}{\frac{S}{60} + \frac{S}{20} + \frac{S}{10}}$ = 18 kmph

(50) Answer : (1)
Solution:
$V = 10 + 2t^2$

$a = \frac{dV}{dt} = 4t$

NEETXRT

BY RIYANSH TORAWAT

CHEMISTRY

SECTION-A

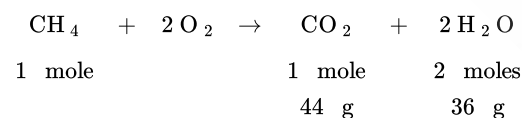**(51) Answer :** (1)
Solution:
S.I. unit of density is Kg m^{-3}

(52) Answer : (1)
Solution:
$\frac{^\circ C}{5} = \frac{F-32}{9}$

$\Rightarrow {}^\circ C = 5\left(\frac{182-32}{9}\right)$ = 83.3°C

(53) Answer : (3)
Solution:

$$CH_4 \quad + \quad 2O_2 \quad \rightarrow \quad CO_2 \quad + \quad 2H_2O$$

1 mole   1 mole   2 moles

                       44 g   36 g

(54) Answer : (1)
Solution:
Definitions of precision and accuracy.

(55) Answer : (3)
Solution:
SI unit of thermodynamic temperature and Luminous intensity are Kelvin and Candela respectively.

(56) Answer : (2)
Solution:
Prefix used for 10^{-15} is femto.

(57) Answer : (2)
Solution:
Sodium – Element
CH_4 – Compound
Fe – Element
Diamond – Element

(58) Answer : (2)

Solution:

1 L = 1000 mL = 1000 cm^3 = 1 dm^3

(59) **Answer :** (3)
Solution:
Atoms of different elements combine in a fixed ratio to form compound.

(60) **Answer :** (1)
Solution:
H_2O and H_2O_2 satisfied the law of multiple proportion.

(61) **Answer :** (2)
Solution:
According to law of conservation of mass

$$\begin{array}{ccc} m_{CaCO_3} & = & m_{CaO} + m_{CO_2} \\ \text{(consumed)} & & \text{(formed)} \end{array}$$

$\Rightarrow \quad 300 \quad = \quad m_{CaO} + 132$

$\quad m_{CaO} \quad = \quad 168 \text{ g}$

(62) **Answer :** (2)
Solution:

Average atomic mass = $\dfrac{\text{Atomic mass of isotape } 1 \times \% \text{ abundance} + \text{Atomic mass of isotape } 2 \times \% \text{ abundance} + \dots}{100}$

(63) **Answer :** (2)
Solution:
1 He atom = 4 u, 25 He atoms = 4 × 25 u

(64) **Answer :** (1)
Solution:
$1 \text{ amu} = \frac{1}{12}$th mass of $C-12$ atom

(65) **Answer :** (3)
Solution:
N_2 : 2x g and O_2 : 5x g

Mole of $N_2 = \frac{2x}{28}$

Mole of $O_2 = \frac{5x}{32}$

$\dfrac{\text{Mole of } N_2}{\text{Mole of } O_2} = \dfrac{\frac{2x}{28}}{\frac{5x}{32}} = \dfrac{2x}{28} \times \dfrac{32}{5x} = \dfrac{16}{35}$

Mole ratio and ratio of molecules will remain same.

(66) **Answer :** (2)
Solution:
Number of electrons in one mole SO_4^{2-} ion = 50 moles.

9.6 g of SO_4^{2-} ions = $\frac{9.6}{96} = 0.1$ mole

Number of electrons = 0.1 × 50 × N_A = 5 N_A

(67) **Answer :** (3)
Solution:
Mass of 0.2 g-molecule of $H_2S_2O_8$ = 0.2 × 194 g

(68) **Answer :** (2)
Solution:
23 g occupies 11.2 L at STP
46 g occupies 22.4 L or 1 mol
$\Rightarrow$ Molar mass of NO_y is 46 g
$\Rightarrow$ y = 2

(69) **Answer :** (4)
Solution:
Mass % of oxygen = $\frac{16 \times 3}{100} \times 100 = 48\%$

(70) **Answer :** (2)
Solution:
Biomolecule should contain atleast 1 atom of Mg

% of Mg = $\frac{\text{Number of Mg atoms}}{\text{wt of biomolecule}} \times 24 \times 100$

Wt of Biomolecule $= \frac{1 \times 24}{2.68} \times 100$

= 895.5 g

(71) Answer : (3)

Solution:

Moles of CCl_4 = $\frac{6.02 \times 10^{25}}{6.02 \times 10^{23}} = 100$ mol

Mass of CCl_4 = 100 × 35.5 = 15400 g

Volume of CCl_4 = $\frac{15400}{1.6} = 9625$ mL

= 9.625 L

NEETXRT
BY RIYANSH TORAWAT

(72) Answer : (3)

Solution:

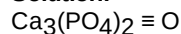| Element	% of mass	Relative number of atom	Simplest ratio
C	52.2	4.35	2
O	34.8	2.175	1
H	13	13	6

(73) Answer : (3)

Solution:

An empirical formula represents the simplest whole number ratio of various atoms present in a compound, whereas the molecular formula shows the exact number of different types of atoms present in a molecule of a compound

(74) Answer : (1)

Solution:

$Ca_3(PO_4)_2 \equiv O$

1 mol   8 moles

1/32 mol   0.25 moles

(75) Answer : (1)

Solution:

1 × 500 = 0.2 × V_2

V_2 = 2500

∴ Volume of water added

= 2500 − 500 = 2000 mL = 2 L

(76) Answer : (2)

Solution:

$MgCO_3 \xrightarrow{\Delta} MgO + CO_2$
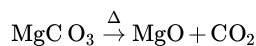
Mole of MgO $= \frac{2.8}{40} = 0.07$

Mole of $MgCO_3$ decomposed = 0.07

Mass of $MgCO_3$ decomposed = 84 × 0.07

= 5.88

% purity $= \frac{5.88}{8.4} \times 100$

= 70%

(77) Answer : (2)

Solution:

HCl   + NaOH   →   NaCl   + H_2O
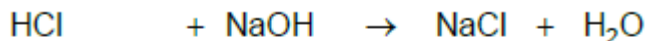
$75 \times \frac{1}{5}$ $50 \times \frac{1}{5}$

= 15 m mol   = 10 m mol

So $[H^+] = \frac{15-10}{125} = \frac{5}{125} = 0.04M = 0.04$ N

(78) Answer : (4)

Solution:

2 H_2S reacts with 1 SO_2

4 H_2S reacts with 2 SO_2

Hence, 2 molecules of SO_2 require 4 molecules of H_2S.

(79) Answer : (2)

Solution:

$n_{H_2} = \frac{n_{Na}}{2} = \frac{23}{2 \times 23} = 0.5$

(80) Answer : (3)

Solution:

A + 2B → 3C

2 mole   2 mole   0

1 mole   0   3 mole
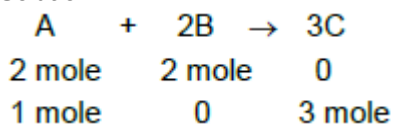
So, maximum moles of C formed = 3

(81) Answer : (2)

Solution:

$\text{Molarity} = \frac{63 \times 1.5 \times 10}{63} = 15 \text{ M}$

(82) Answer : (3)

Solution:

Molarity – mol L^{-1}

Mole fraction – Unitess

Molality – mol kg^{-1}

Amount of substance – mole

(83) Answer : (4)

Solution:

Moles of Na^+ = 2 × 25 × 0.1 × 10^{-3} = 5 × 10^{-3}

(84) Answer : (3)

Solution:

$\text{Mole fraction} = \frac{\text{Mole of solute}}{\text{Mole of solute + mole of solvent}}$

Mole of water = $\frac{1000}{18}$

= 55.55

$\text{Mole fraction} = \frac{4.45}{4.45 + 55.55} = \frac{4.45}{60}$

= 0.074

(85) Answer : (4)

Solution:

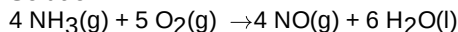The given statement is known as law of definite proportions.

SECTION-B

(86) Answer : (2)

Solution:

Molar mass of the gas

= 1.97 × 22.4 = 44 g

∴ Gas is CO_2

(87) Answer : (3)

Solution:

Molality does not depends on temperature.

(88) Answer : (3)

Solution:

4 NH_3(g) + 5 O_2(g) →4 NO(g) + 6 H_2O(l)

Given, 1.5 mole of ammonia and 1 mole of O_2

∴ O_2 is limiting reagent therefore all the oxygen will be consumed.

(89) Answer : (1)

Solution:
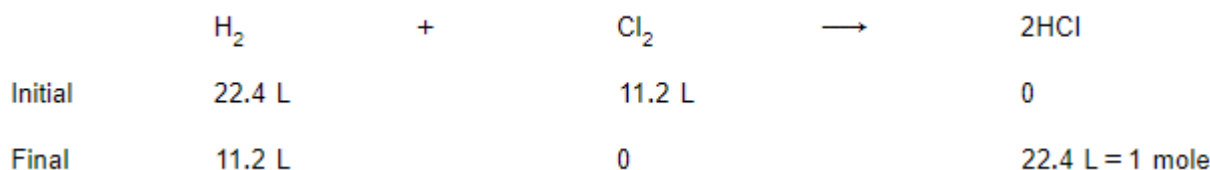
	H_2	+	Cl_2	⟶	2HCl
Initial	22.4 L		11.2 L		0
Final	11.2 L		0		22.4 L = 1 mole

(90) Answer : (4)

Solution:

Mass of $CaCO_3$ = $\frac{4 \times 75}{100} = 3\,kg = 3000\,g$

$\therefore$ Volume of CO_2 obtain = $\frac{22.4}{100} \times 3000\,L = 672\,L$

(91) Answer : (4)

Solution:

$C_6H_{12}O_6 \Rightarrow (CH_2O)_6$
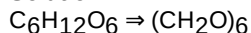
(92) Answer : (2)

Solution:

Formula in which atoms present are in simplest ratio is known as empirical formula.

Elements	% mass	Atomic mass	Moles atoms	Simple ratio
A	75	60	$\frac{75}{60} = \frac{5}{4}$	1
B	25	20	$\frac{25}{20} = \frac{5}{4}$	1

Empirical formula = AB.

(93) Answer : (4)

Solution:

$Mole = \frac{wt.}{Molar\ mass}$

$\frac{n_{O_3}}{n_{O_2}} = \frac{\left(\frac{320}{48}\right)}{\left(\frac{160}{32}\right)} = \frac{4}{3}$

(94) Answer : (2)

Solution:

Volume of 1 mole of a gas at STP = 22.4 L

28 g of N_2 = $\frac{28}{28}$

= 1 mol = 2 N_A atoms

• 44.8 L of O_2 = $\frac{44.8}{22.4}$

moles = 2 moles

= 4 N_A atoms

• 18 mL of H_2O = 18 g of H_2O = $\frac{18}{18}$ mol

= 1 mole = 3 N_A atoms

• 1.5 mol of He = 1.5 N_A atoms

(95) Answer : (1)

Solution:

According to law of conservation of mass, in any physical or chemical change, mass of reactants is always equal to mass of products.

(96) Answer : (2)

Solution:

Number of glucose molecules $= \frac{540}{180} = 3$

Number of atoms = 3 × 24 = 72

(97) Answer : (3)

Solution:

If atomic masses of X and Y respectively are a and b.

Then a + b = 100 … (i)

2a + 3b = 240 … (ii)

On solving equation (i) and (ii)

a = 60, b = 40

(98) Answer : (3)

Solution:

0. 00001732 is written as 1.732×10^{-5}

(99) Answer : (3)

Solution:

224 ml = 0.44 g

22400 ml = 44 g

$$Vapour\ density = \frac{Molecular\ Mass}{2}$$

So V.D = 22

(100) Answer : (4)
Solution:
Molality is number of moles of solute present in 1 kg of solvent.
Molarity is number of moles of solute present in 1 L of solution.

BOTANY

SECTION-A

NEETXRT

BY RIYANSH TORAWAT

(101) Answer : (2)
Solution:
According to cell theory all cells arise from pre-existing cells.

(102) Answer : (3)
Solution:
Schleiden and Schwann together formulated the cell-theory.

(103) Answer : (2)
Solution:
Inclusion bodies are non-membrane bounded structures that lies free in the cytoplasm.

(104) Answer : (4)
Solution:
Nucleolus is present in eukaryotic cells.

(105) Answer : (4)
Solution:
Blue-green algae do not have true nucleus.
Blue-green algae are prokaryotes as they lack membrane bound cell organelles and nucleus.

(106) Answer : (3)
Solution:
– Ribosome is the only cell organelle found in both prokaryotic and eukaryotic cell.
– Fimbriae are fine bristle like structures of bacteria, which help in attachment with substratum.

(107) Answer : (1)
Solution:
Plasmids are circular dsDNA.
Plasmids are smaller than genomic DNA.

(108) Answer : (2)
Solution:
Golgi complex is involved in glycosylation of proteins.
Contractile vacuole – Excretion
RER – Protein synthesis
Amyloplast – Stores starch

(109) Answer : (4)
Solution:
Several ribosomes may attach to a single mRNA and form a chain called polyribosomes or polysome. Ribosomes are the site of protein synthesis.

(110) Answer : (2)
Solution:
Metacentric – V-shaped
Sub-metacentric – L-shaped
Acrocentric – J-shaped
Telocentric – I-shaped

(111) Answer : (3)
Solution:
Glycocalyx when thick and tough is called capsule and if loose then it is called slime layer.

(112) Answer : (4)
Solution:
Plasma membrane is asymmetrical because, the membrane associated with lipids are asymmetric with polar and non-polar ends. It contains both hydrophilic and hydrophobic regions. In plasma membrane, tail of lipid is non-polar and

head is polar. Human RBC membrane is composed of approximately 52% protein and 40% lipid.

(113) Answer : (3)
Solution:
Algal cell wall is made up of cellulose, galactans, mannans and calcium carbonate.

(114) Answer : (1)
Solution:
In all cells, cytoplasm is the main arena of the various types of cellular activities.

(115) Answer : (4)
Solution:
Cell wall provides barrier to undesirable macromolecules.

(116) Answer : (4)
Solution:
Mitochondria has circular double stranded DNA.

(117) Answer : (3)
Solution:
Chromatophores contain pigments for photosynthesis.
Chromatophores take part in photosynthesis in many prokaryotes. A protoplast is a cell without cell wall.

(118) Answer : (1)
Solution:
Nucleoli are the site for rRNA synthesis.
Nucleoli are large and more numerous in those cells which are actively involved in protein synthesis.

(119) Answer : (3)
Solution:
Cytoskeleton maintains the shape of cell as well as helps to provide motility.

(120) Answer : (3)
Solution:
The organelles included in endomembrane system are endoplasmic reticulum, Golgi apparatus, lysosomes and vacuoles. Their functions are co-ordinated.
Functions of chloroplasts are not coordinated with cell organelles of endomembrane system. Hence, it is not considered as a part of endomembrane system.

(121) Answer : (3)
Solution:
Nerve cells are branched and long.
Mesophyll cells are round and oval.

(122) Answer : (1)
Solution:
Golgi apparatus was first observed and described by Camillo Golgi. Camillo Golgi described Golgi apparatus as a densely stained reticular structures present near the nucleus of the cell. Therefore, these were given the name Golgi body, after his name.

(123) Answer : (1)
Solution:
Plasmodesmata are living connections in dead cell wall.

(124) Answer : (3)
Solution:
Peripheral doublets are connected to central sheath by radial spokes in eukaryotic flagella.

(125) Answer : (4)
Solution:
RER provides precursors of enzymes for the formation of lysosomes in Golgi complex.

(126) Answer : (3)
Solution:
Mesosome helps in respiration, secretion processes, DNA replication and cell wall formation.

(127) Answer : (3)
Solution:
In fluid mosaic model proteins float in the lipid bilayer as ice bergs.

(128) Answer : (2)
Solution:
Human RBCs are 7.0 μm in diameter.

(129) Answer : (4)
Solution:

Lysosomes are very rich in almost all types of hydrolytic enzymes.

(130) Answer : (3)
Solution:
Infoldings of inner membrane of mitochondria are called cristae.

(131) Answer : (2)
Solution:
'S' stands for Svedberg coefficient or sedimentation coefficient and it is indirect measure of density and size of ribosomal sub units.

(132) Answer : (1)
Solution:
Carotenoids are hydrophobic and fat soluble pigments.

(133) Answer : (2)
Solution:
Membrane proteins are of larger size and do not show flip-flop movement.

(134) Answer : (1)
Solution:
Mature Sieve tube cell lacks nucleus.

(135) Answer : (2)
Solution:
Thylakoids in chloroplast stack to form grana.

SECTION-B

(136) Answer : (4)
Solution:
Cell wall protects cell from mechanical injury.

(137) Answer : (1)
Solution:
The basal body of cilia and flagella have centriole –like arrangement of microtubules (9 + 0 arrangement).

(138) Answer : (4)
Solution:
Red colour of chilli and tomato is due to chromoplast.

(139) Answer : (1)
Solution:
Cell wall and plastids are absent in animal cells.
Microbodies are found in both plant and animal cells.

(140) Answer : (2)
Solution:
Mitochondria is the site for ATP synthesis and oxidative phosphorylation.

(141) Answer : (2)
Solution:
In plants Golgi bodies are known as dictyosome.

(142) Answer : (2)
Solution:
Bacillus – rod like, Coccus – spherical, Vibrio – comma shaped, Spirillum – spiral.

(143) Answer : (3)
Solution:
Middle lamella is cementing material between two plant cells. It is chiefly made up of calcium and magnesium pectate.

(144) Answer : (4)
Solution:
'Fluid mosaic model' about cell membrane was given by Singer and Nicolson.

(145) Answer : (2)
Solution:
Plasmid DNA confers certain unique phenotypic characters to many bacteria. It is present outside the genomic DNA.

(146) Answer : (3)
Solution:
Tonoplast is the membrane of sap vacuole of plant cells.

(147) Answer : (4)
Solution:

Chloroplast and mitochondria have RNA. RNA is also present in ribosomes (RNA + Protein) and nucleus.

(148)Answer : (3)
Solution:
Centrioles occur in pair at right angle to each other.

(149)Answer : (3)
Solution:
Ribosomes are called palade particles.

(150)Answer : (3)
Solution:
Prokaryotes have 70S ribosomes that are made up of 50S and 30S subunits.

NEETXRT
BY RIYANSH TORAWAT

ZOOLOGY

SECTION-A

(151)Answer : (2)
Solution:
Identify a loose connective tissue.
Adipose tissue stores fats and is located mainly beneath the skin and also around the heart, kidney, eyeballs, *etc*.
Areolar tissue serves as support framework for epithelium and joins skin to muscles and fills the space outside organs.
Tendons connect muscles to bones and a ligament connects bone to bone.

(152)Answer : (3)
Solution:
Cartilage is present in our tip of nose, outer ear joints, between adjacent bones of the vertebral column, limbs and hands in adults. Biceps are skeletal muscles.

(153)Answer : (3)
Solution:
The epithelial tissue faces either a body fluid or the outside environment and thus provides a covering or lining for some parts of the body.

(154)Answer : (4)
Solution:
Exocrine products are released through ducts or tubes.

(155)Answer : (2)
Solution:
Compound epithelium covers dry surface of skin, pharynx, inner lining of ducts of salivary glands and of pancreatic ducts. Alveoli of lungs are lined by squamous epithelium.
Inner surfaces of fallopian tubes are lined by ciliated epithelium.
Inner surface of intestine is lined by columnar epithelium.

(156)Answer : (2)
Solution:
• Fibroblast cells produce and secrete fibres and matrix.
• Macrophages or Histiocytes ingest cell debris, bacteria and foreign matter.
• Mast cells produce histamine, heparin and serotonin.

(157)Answer : (1)
Solution:
Fibres and fibroblasts are compactly packed in the dense connective tissue.

(158)Answer : (2)
Solution:
Epithelium present in the ducts of glands and tubular parts of nephrons in the kidneys is non-ciliated cuboidal epithelium.

(159)Answer : (2)
Solution:
Tight junctions help to stop substances from leaking across a tissue.

(160)Answer : (3)
Solution:
Tendons are cord-like, strong, inelastic structures that join skeletal muscle to bone. Ligaments are structures which connect bone to bone.

(161)Answer : (2)

Solution:
Tissue is defined as group of similar cells (having same embryonic origin and structure) with intercellular substances that perform a specific function.

(162) Answer : (1)
Solution:
Macrophage – Engulfs debris and pathogens
Fibroblast – Produces and secretes fibres
Mast cell – Secretes heparin, histamine and serotonin
Adipocyte – Stores fats

(163) Answer : (4)
Solution:
Goblet cells are isolated glandular cells of epithelium.

(164) Answer : (4)
Solution:
Adult human haemoglobin has 4 polypeptide chains in its quaternary structure –2α and 2β chains.

(165) Answer : (1)
Solution:
Phospholipids are conjugated lipids. Phospholipids are found in cell membrane. Fibroin protein is found in natural silk. Chitin is homopolymer present in exoskeleton of arthropods.

(166) Answer : (3)
Solution:
One full turn of double helix of B-DNA has 10 base pairs.

(167) Answer : (3)
Solution:
First amino acid is present at left end of a polypeptide chain and is called N-terminal amino acid.

(168) Answer : (1)
Solution:
Competitive inhibition could be reversed by increasing the concentration of substrate.

(169) Answer : (3)
Solution:
A nucleotide has three chemically distinct components. One is a heterocyclic compound, the second is a monosaccharide and the third is a phosphoric acid or phosphate.

(170) Answer : (2)
Solution:
Receptors are proteins, usually cell surface receptors, which bind to ligands and cause responses in the immune system, including cytokine receptors, growth factor receptors, *etc*.

(171) Answer : (1)
Solution:
Ligases: Enzymes catalysing the linking together of 2 compounds, *e.g.,* enzymes which catalyse joining of C–O, C–S, C–N, P–O, *etc*., bonds.

(172) Answer : (1)
Solution:
Hint : Almost all enzymes are proteins.
Sol.: Ribozyme and ribonuclease both have catalytic power.
High temperature can cause denaturation of proteins.

(173) Answer : (2)
Solution:
Unsaturated fatty acids have both single and double bonds in their structure.

(174) Answer : (2)
Solution:
Connective tissue is the most abundant and widely distributed tissue in the body of complex organisms.

(175) Answer : (2)
Hint:
Intestinal muscles fibres are non striated and not in direct control of our will.
Solution:
Smooth muscles fibres are tapered at both end (fusiform) and uninucleated.

(176) Answer : (2)
Solution:

	Column I		Column II
a.	Phospholipid	(iv)	Lecithin

b.	Nucleoside	(iii)	Adenosine
c.	Nitrogenous bases	(ii)	Cytosine
d.	Amino acid	(i)	Glycine

(177) Answer : (2)
Solution:
Haem is the prosthetic group of enzymes peroxidase and catalase. NADP is a co-enzyme that contains niacin.

(178) Answer : (1)
Solution:
Alanine can produce zwitterionic form.

(179) Answer : (2)
Solution:
Positional information of amino acids decides specificity of enzyme action.
Apoenzymes are proteinaceous part of holoenzymes. Enzymes act by lowering activation energy barrier.

(180) Answer : (3)
Solution:
Digestive enzymes belong to this class of enzymes.
Hydrolases use water to break larger molecules into smaller molecules.
Transferases catalyse the transfer of specific group from one substrate to another.
Lyases catalyse the cleavage of substrate into two parts without hydrolysis.
Oxidoreductases catalyse oxidation-reduction reactions.

(181) Answer : (3)
Solution:
They make up 1% of total cellular mass

Component	% of total cellular mass
Water	70-90
Proteins	10-15
Lipids	2
Ions	1

(182) Answer : (4)
Hint:
Heat is released in an exothermic reaction.
Solution:
In exothermic reactions, the energy content of the product is lower than that of the substrate as heat is released.

(183) Answer : (3)
Hint:
Select toxins
Solution:
Abrin and ricin are toxins obtained from plants *Abrus* and *Ricinus* respectively.

(184) Answer : (1)
Solution:
Collagen is the most abundant protein in animal world.

(185) Answer : (4)
Solution:
Chitin is a structural polysaccharide.

SECTION-B

(186) Answer : (2)
Solution:
The α-helix and β-pleated sheets are two types of secondary structures.
In proteins, only right-handed helices are observed.

(187) Answer : (1)
Solution:
Bone is the main tissue that provides structural frame to the body. Bones have a hard and non-pliable ground substance rich in calcium salts and collagen fibres which give bone its strength.

(188) Answer : (3)
Solution:
Muscle fibres show contraction and relaxation. Only neurons show conduction of nerve impulse not neuroglial cells.

(189) Answer : (2)
Solution:
Two cardiac muscle fibres are connected *via* intercalated disc.

(190) Answer : (3)
Solution:
Activity cannot be restored in denatured enzymes.

(191) Answer : (2)
Solution:
The substrate binds to the active site of the enzyme for which it has to diffuse towards the active site. There is an obligatory formation of an enzyme-substrate complex. This complex formation lasts only for a short time and is a transient phenomenon.

(192) Answer : (4)
Solution:
Homopolysaccharides – Chitin, inulin, starch, glycogen.
Polypeptides are heteropolymers of amino acids.

(193) Answer : (3)
Solution:

$$X-Y \atop C-C \xrightarrow{\text{Lyase}} X-Y + C=C$$
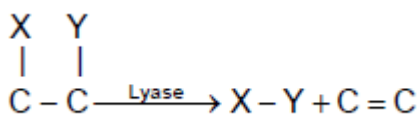
(194) Answer : (1)
Solution:
Malonate competes with succinate for the active site of enzyme succinic dehydrogenase.

(195) Answer : (2)
Solution:
According to Chargaff's rule, A = T and G = C
So, if A is 20% then T is 20%, G and C will be 30% each.

(196) Answer : (2)
Hint:
Protein part of a holoenzyme.
Solution:
Non-protein part of a holoenzyme is called co-factor which may be tightly bound with apoenzyme and is called prosthetic group. Co-enzymes are also organic compounds which associate transiently with apoenzyme usually during catalysis. Protein part of holoenzyme is called apoenzyme.

(197) Answer : (3)
Solution:
Glycosidic bond is formed between the sugar molecule and nitrogenous base molecule.
Hydrogen bond is present between the bases in opposing strands of DNA. The bond between the hydroxyl group of sugar and phosphate is ester bond.

(198) Answer : (1)
Solution:
Collagen is most abundant protein in the animal body. In human beings, it constitutes about 30% of total body proteins.
RuBisCO is most abundant protein in whole of the biosphere.

(199) Answer : (1)
Solution:
Hydrolases belong to class III of enzymes.

(200) Answer : (2)
Solution:
The activation energy of a reaction decreases in the presence of an enzyme.