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NEET- 2024

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ANSWER KEY & SOLUTION KEY FINAL ROUND - 01 (PCB) Dt.01.04.2024

BOTANY

SECTION - A (35 Questions)

01. **(3)** (11th NCERT PK,Page no.31 to 32 conceptual)
02. **(3)** (NCERT XII, Pg 113, 6.6.1)
03. **(1)** (NCERT XII, Pg 80, 5.3.1)
04. **(2)** (NCERT XII: Page No: 79, Fig. 5.7, Independent assortment based)
05. **(4)** (NCERT XII, Pg. 92 , Para 2, Down's syndrome based)
06. **(3)** (11th NCERT Page no.25 to 31)
07. **(3)** (NCERT XII, Pg 102, Figure 6.5)
08. **(1)** (11th, para 8.5.10, page no. 138/bot.)
09. **(4)** (11th, para 8.5.10, page no. 138/bot)
10. **(2)** (NCERT XII, Pg 98, Point iv)
11. **(1)** (11th NCERT Page No.32)
12. **(3)** (NCERT XII, Pg 106, 6.4.2)
13. **(2)** (NCERT XI; sub-topic 5.1.2, 5.2.1 & 5.6)
14. **(1)** (11th, para 10.4, page no. 168/bot.)
315. **(3)** (NCERT XI Page No. 77, sub-topic 5.7.2)
16. **(3)** (11th, para 10.4.2, page no. 169/bot.)
17. **(2)** (NCERT XI Page No. 78, sub-topic 5.8)
18. **(3)** [NCERT XI Pg. No. 209, 13.3, 3rd paragraph and Pg. No 215, 13.7]
19. **(2)** [NCERT XI Pg. No. 209, 13.3, 3rd paragraph]
20. **(3)** (NCERT 11th, Page no- 22, Paragraph- 2.3, Line no-2)
21. **(2)** (NCERT 11th, Page no- 24, Paragraph- 2.3.4, Line no- 31, 32, 33)
22. **(3)** [NCERT class XI, Page no. 90, First paragraph, Point no. 6.2.3]
23. **(1)** (NCERT 12th, Page no- 37, Last paragraph, Line no- 1 and 2
    NCERT 12th, Page no- 38, Last paragraph, Line no- 1 to 8)
24. **(3)** [NCERT XI, Page 250, point 15.4.3.4]
25. **(2)** (NCERT XI Pg.227 Introuction part)
26. **(2)** (NCERT XI Pg.229 Introuction part)
27. **(2)** (NCERT 11th, Page no- 18, 1st Paragraph, Line no- 6 and 7)
28. **(4)** (NCERT 11th, Page no- 8, 3rd Paragraph, Line no- 16-18)
29. **(1)** (NCERT XII, Pg 83, 5.3.3)
30. **(3)** (NCERT XII, Pg 112, Para 1)
31. **(2)** (NCERT 12th, Page no- 35, Last Paragraph, Line no- 30, 31)
32. **(3)** (NCERT 12th, Page no- 34, 1st paragraph, Line no- 8, 9, 10)
33. **(1)** (12th NCERT page no.243 1st para)
34. **(3)** (11th, para 8.3, page no. 126/ bot.)
35. **(4)** [NCERT class XI, Page no. 94, Third paragraph]

SECTION - B (Attempt Any 10 Questions)

36. **(4)** (11th, para 8.2, page no. 126/bot.)
37. **(3)** (NCERT XII, Pg 87, Para 3, Line 16)
38. **(3)** (NCERT 11th, Page no- 8, Paragraph- 1.3, Line no- 1 and 2)
39. **(2)** (NCERT XI Page No. 69, sub-topic 5.3, 1st para)
40. **(1)** (NCERT 12th, Page no- 31, 3rd paragraph, Line no- 17- 20)
41. **(2)** (11th, para 8.5.10, page no. 138, 139/bot.)
42. **(1)** (12th NCERT Page no.247, fig.14.3,CONCEPT)
43. **(1)** [NCERT XI, Page 250, Line no. 01-02]
44. **3)** (11th NCERT PK. Page no.23 to 24)
45. **(3)** (NCERT XI Pg.235-14.6, 7th line 2nd para)
46. **(1)** (NCERT XII: Page No: 119, Para 2, Line 3, 15, Para 3- line 1)
47. **(2)** (NCERT XII, Pg 92, Para 3)
48. **(2)** (NCERT 11th, Page no- 21, Paragraph- 2.2.3, Line no- 15)
49. **(3)** [NCERT XI Pg. No. 211 and 212, 13.6 and 13.6.1]
50. **(2)** [NCERT class XI, Page no.91, 92, 93, Point no. 6.3.3]

ZOOLOGY

SECTION - A (35 Questions)

51. **(3)** (NCERT XI Page No. 55, Last line of 3rd paragraph)
52. **(2)** (NCERT XI Page No. 290, 3rd line of 2nd paragraph)

53. **(4)** (NCERT XI Page No. 332 fig. 22.1)
54. **(2)** (12th, para10.2., , page no. 181, 182/ zoology)
55. **(4)** [NCERT P. No.208, 5th GMO Point]
56. **(2)** [NCERT P. No.307 5th line]
57. **(1)** [NCERT Practical Syllabus P. No.124 Point No. 7th]
58. **(3)** NCERT12th, 4.4 STD, Page No. 63)
59. **(4)** (NCERT 11th, Page no- 148, 1st Paragraph, Line no-6)
60. **(4)** (NCERT11th, Page No.116, frog)
61. **(2)** (12th, para 10.4 , page no.185/zoology.)
62. **(3)** (NCERT Pg. No. 278)
63. **(2)** (Body fluid and Human health mixed question)
64. **(3)** (NCERT 12th, Page no-141, 1st paragraph, Line no- 2)
65. **(3)** [NCERT P.No.321 Midbrain Para]
66. **(1)** [NCERT P. No.195, Last Para]
67. **(4)** (NCERT 12th, Page no- 135, Last paragraph, Line no- 7,8)
68. **(1)** (NCERT 11th, Page no- 158, Paragraph-9.12.5, Line no- 3 and 4)
69. **(3)** (NCERT -Pg.No-286)
70. **(2)** (12th NCERT Page no.232, table 13.1)
71. **(2)** (12th Old NCERT, page no.263 4th line)
72. **(4)** (NCERT 11th p.no. 101 para3)
73. **(2)** (NCERT 11th p.no. 103, FIG 7.4 a)
74. **(2)** (NCERT -Pg.No. 270-271)
75. **(3)** (NCERT12th page no.62, 4.3 MTP)
76. **(4)** (NCERT P.No. 149-150)
77. **(2)** (NCERT Pg. No. 287 - Disorder of circulatory system)
78. **(2)** [NCERT P. No.318, Para Below Diagram]
79. **(3)** [NCERT P. No.316, ANS Para]
80. **(3)** (12th NCERT, Page no.228, 13.2.2)
81. **(2)** (NCERT 12th, Page no- 127, 3rd paragraph, Line no- 6)
82. **(1)** (NCERT XI Page No. 55, Last paragraph)
83. **(4)** [NCERT P. No.312 3rd & 4th para]
84. **(4)** (NCERT XIIth Page No. 55 , Para 2 line 4)
85. **(4)** (NCERT XI Page No. 291, Last line of first paragraph)

SECTION - B (Attempt Any 10 Questions)

86. **(1)** (NCERT 11th p.no. 115, para 2 line3)
87. **(2)** (12th, para 10.4, page no. 185/zoology.)
88. **(3)** [NCERT P. No.302 11th line]
89. **(1)** (NCERT Pg. No. 158)
90. **(2)** (NCERT - Pg. No. 282)
91. **(3)** [NCERT P. No.200, Vectros for Cloning gene 9th Line]
92. **(3)** (NCERT XI Page No. 290, 1st paragraph)
93. **(4)** (NCERT 11th, Page no- 158, 1st Paragraph, Line no-11-13)
94. **(4)** [NCERT P. No.321, Forebrain para Line 18]
95. **(1)** (NCERT XI Page No. 332, last line)
96. **(3)** (NCERT 12th, Page no- 127, 3rd paragraph, Line no- 9, 10)
97. **(2)** 12th Old NCERT Page no.266 ,15.2.2)
98. **(3)** (NCERT12th page no 53, para2, line-3)
99. **(4)** (NCERT 12th, page no 45, Fig. 3.3. b)
100. **(3)** (NCERT P.No. 272 - Exchange of gases)

PHYSICS

SECTION - A (35 Questions)

101. **(4)** $\Delta PE_g = 100$ m ....(i)

Total energy loss in 1 complete round on horizontal floor

$w_{f_r} = \mu mg(2S) = 0.2$ m (10) 20

$W_{f_r} = (40)m$ in 1 round

102. **(1)** 103. **(3)** 104. **(3)**

105. **(1)** $I_z = I_1 + I_2 + I_3$

$= \frac{ML^2}{3} + \frac{ML^2}{3} + 0 = \frac{2ML^2}{3}$

106. **(1)** As external torque is zero therefore angular momentum will remain conserved. So $I_1\omega_1 = I_2\omega_2$.

So $\omega \propto \frac{1}{R^2}$ so $T \propto R^2$, if radius becomes half then time period becomes $\frac{1}{4}$ of the previous value

i.e. $\frac{24}{4} = 6$ hours.

107. **(3)**

108. **(2)** $v_{rms} = \sqrt{\frac{3RT}{M_0}}$

$v_{rms}^2 = \frac{3RT}{M_0}$

$v_{rms}^2 \propto T$

The graph between v_{rms}^2 v/s T is straight line, through origin.

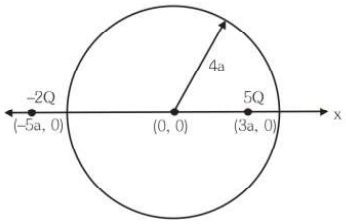
109. **(1)**

110. **(1)** Loss of Energy $= \frac{C_1C_2}{2(C_1+C_2)} (V_1 - V_2)^2$

$= \frac{1}{2}\left(\frac{C}{2}\right)(3V - 2V)^2$

$= \frac{1}{4}CV^2$

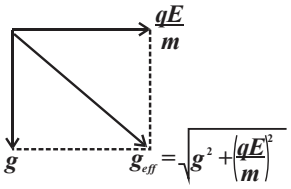
111. **(2)**



5Q charge is inside the spherical region flux through sphere $= \frac{5Q}{\varepsilon_0}$

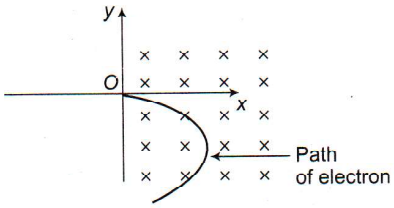
112. **(2)** The rate of decrease of electric field is different in the two cases. In case of a point charge, it decreases as $1/r^2$ but in the case of electric dipole it decreases more rapidly, as $E \propto 1/r^3$.

113. **(4)** As electric force qE is constants in magnitude and direction both so we can replace $g \rightarrow g_{eff}$



114. **(4)** Potential difference between A and B,
$V_A - V_B = 1 \times 1.5$
$\Rightarrow V_A - 0 = 1.5$ V $\Rightarrow V_A = 1.5$ V
Potential difference between B and C,
$V_B - V_C = 1 \times 2.5 = 2.5$V $\Rightarrow V_C = -2.5$V
Now, $V_D - V_C = 2$ volt

115. **(4)** y will be less than zero.
The trajectory will be as (use Fleming's left hand rule)



116. **(4)** As is known from theory, induced emf,
$e = e_0 \sin\theta = NBA\omega \sin\omega t$.

117. **(3)** $\omega' = \omega$

$\frac{1}{\sqrt{L'C'}} = \frac{1}{\sqrt{LC}}$

$\therefore L'C' = LC$

$4LC' = LC$

$C' = \frac{C}{4}$

$\because$ capacitance must be decreased by $\frac{3C}{4}$

118. **(3)** $\lambda_m > \lambda_v > \lambda_x$

119. **(1)** $E_k = \boldsymbol{hv} - \phi$
Compare with $y = mx - c$
Slope $= h$

120. **(1)** $\frac{1}{\lambda_{Balmer}} = R\left(\frac{1}{2^2} - \frac{1}{3^2}\right) = \frac{5R}{36}$,

$\frac{1}{\lambda_{Lyman}} = R\left(\frac{1}{1^2} - \frac{1}{2^2}\right) = \frac{3R}{4}$,

$\therefore \lambda_{Lyman} = \lambda_{Balmer} \times \frac{5}{27} = 1215.4$Å.

121. **(2)** For freely falling body

$H = \frac{1}{2}gt^2 (U = 0)$

$\Rightarrow g = \frac{2H}{t^2} \Rightarrow \frac{\Delta g}{g} = \frac{\Delta H}{H} + \frac{2\Delta t}{t}$

% Error $= \frac{\Delta g}{g} \times 100 = c_1 + 2c_2$

122. **(2)** $\frac{PV}{T}$ = constant (for given mass of ideal gas)
AB : isochoric process, V : constant , T is increasing hence, P is increasing.
BC : isobaric process, P : constant , T is decreasing hence, V is decreasing.
CA : isothermal process, P is decreasing , hence, V is increasing, P-V diagram is rectangular hyperbola.

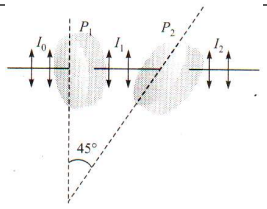
123. **(1)** Isotones means equal number of neutrons
i.e., $(A - Z) = 74 - 34 = 71 - 31 = 40$.

124. **(4)** The $(x - t)$ graph shown by option (4) is not periodic as it is not identically repeated in a definite interval of time.

125. **(1)** $y - a \sin((\omega t + kx)$
$\Rightarrow$ Wave is moving along –ve x-axis with speed

$v = \frac{\omega}{K} \Rightarrow v = \frac{50}{2} = 25$ m/sec

126. **(2)** Intensity of light after passing polaroid P_1 is I_1
$= \frac{I_0}{2}$



Now this light pass through the second polaroid P_2 whose axis is inclined at an angle of 45° to the axis of polaroid P_1. So in accordance with Malus law, the intensity of light emerging from polaroid B is

$$I_2 = I_1 \cos^2 45^0 = \left(\frac{I_2}{2}\right)\left(\frac{1}{\sqrt{2}}\right)^2 = \frac{I_0}{4}$$

127. **(3)** $\frac{V_1}{V_2} = \frac{N_1}{N_2}$

$$\frac{230}{V_2} = \frac{1000}{100}$$

$$V_2 = 23V$$

$$\text{Power consumed} = \frac{V_2^2}{R}$$

$$= \frac{23 \times 23}{46} = 11.5\,\text{W}$$

128. **(4)** For telescope

Tube length $(L) = f_o + f_e = 60$

and magnification $(m) = \frac{f_o}{f_e} = 5 \Rightarrow f_o = 5f_e$

$\therefore\ f_o = 50$ cm and $f_e = 10$ cm

Hence focal length of eye-piece, $f_e = 10$ cm.

129. **(4)** From law of conservation of momentum,

$\vec{p}_i = \vec{p}_f$

$m_1u_1 + m_2u_2 = MV_f$

$$V_f = \frac{\left(mv + \frac{mv}{4}\right)}{3m/2} = \frac{5v}{6}.$$

$\Rightarrow$ Body will move in elliptical path

130. **(3)** Due to acceleration towards right, there will be a pseudo force in a left direction. So the pressure will be more on rear side (Points A and B) in comparsion with front side (points D and C) Also due to height of liqid column, pressure will be more at the bottom (points B and D) in comparison with top (points A and C). So overall maximum pressure will be at point B and minimum pressure will be at point C.

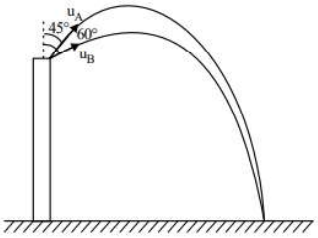
131. **(1)** Density of wood $= 0.5\,\frac{\text{gm}}{\text{cc}}$

$$= 0.5 \times \frac{10^{-3}\,\text{kg}}{10^{-6}\ \text{cubic meter}}$$

$= 500\ \text{kg/m}^3$

132. **(3)** The number of significant figure is 5 as 10^{-6} does not affect this number.

133. **(3)**



For v_A & v_B at different angles, time of flight and range can not be same. So options (3) is correct.

134. **(2)** Impulse is defined as change of momentum. For change in momentum to be minimum

$$\frac{d}{dt}\left(20t^2 - 40t\right) = 0$$

$40t - 40 = 0 \Rightarrow t = 1$ s

135. **(3)** $K_0 = \frac{p_0^2}{2m}$ ...(i)

p' = p_0 + 100% of p_0

$p' = 2p_0$

$$K' = \frac{p'^2}{2m}$$

$$K' = \frac{(2p_0)^2}{2m} \Rightarrow K'' = 4K_0$$

$$\%\ \text{change in K.E.} = \frac{K' - K_0}{K_0} \times 100\%$$

$$= \frac{4K_0 - K_0}{K_0} \times 100\% = 300\%$$

SECTION - B (Attempt Any 10 Questions)

136. **(3)** $I_{net} = I_1 + I_2 + 2\sqrt{I_1 I_2}\cos\phi$

$$= I_0 + I_0 + 2I_0 \cos\frac{\pi}{3}$$

$$= 2I_0 + 2I_0 \times \frac{1}{2} = 3I_0$$

$$I_{net} = I_0 + I_0 + 2I_0 \cos 90° = 2I_0$$

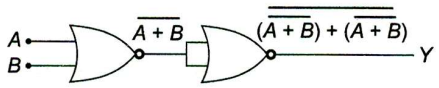
$$\text{Ratio} = \frac{3}{2}$$

137. **(4)** $\Delta Q = c.m\ dt$

$$Q = \int_{6}^{10} 0.6t^2 \times 10dt$$

$$Q = 6\left[\frac{t^3}{3}\right]_0^{10} = 6 \times \frac{1000}{3} = 2000cal. = 2kcal.$$

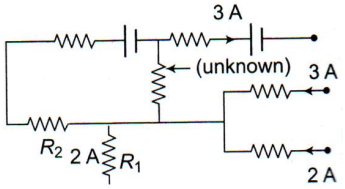
138. **(4)**



A	B	$A+B$	$\overline{A+B}$	$\overline{(A+B)}+\overline{(A+B)}$	Y
0	0	0	1	1	0
0	1	1	0	0	1
1	0	1	0	0	1
1	1	1	0	0	1

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

139. **(4)** Since 3 A is in upper part of circuit. Therefore out of 5A coming in lower part, 3A has to go to the upper part, out of which some part will flow through R_2 and rest through the unknown resistance.



$\therefore$ 2A will go through R_1.

140. **(4)** $\lambda_p = \lambda\alpha$

$$\text{or } \frac{h}{\sqrt{2m_pQ_pV}} = \frac{h}{\sqrt{2m_\alpha Q_\alpha V_\alpha}}$$

$$\therefore \; m_pQ_pV = m_\alpha Q_\alpha V_\alpha$$

$$\therefore \; V_\alpha = \left(\frac{m_p}{m_\alpha}\right)\left(\frac{Q_p}{Q_\alpha}\right)V = \left(\frac{1}{4}\right)\left(\frac{1}{2}\right)V = \frac{V}{8}.$$

141. **(1)** Force on wire Q due to wire P is

$$F_P = 10^{-7} \times \frac{2 \times 30 \times 10}{0.01} \times 0.1 = 6 \times 10^{-5} N$$

(Towards left)

Force on wire Q due to wire R is

$$F_R = 10^{-7} \times \frac{2 \times 20 \times 10}{0.02} \times 0.1 = 20 \times 10^{-5} \text{N}$$

(Towards right)

Hence

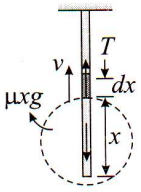
$$F_{net} = F_R - F_P = 14 \times 10^{-5} \text{N} = 1.4 \times 10^{-4} \text{N/m}$$

142. **(3)** Let linear mass density (mass/length) is μ. Consider x length of the string, the tension at this position is T.

$T = (x\mu)g$

The velocity of wave pulse

$$v = \sqrt{\frac{T}{\mu}} = \sqrt{\frac{(x\mu)g}{\mu}} = \sqrt{gx}$$



$$\frac{dx}{dt} = \sqrt{gx} \Rightarrow \frac{dx}{\sqrt{x}} = \sqrt{g}\,dt$$

$$\Rightarrow \int_0^{20} \frac{dx}{\sqrt{x}} = \sqrt{g}\int_0^t dt$$

On solving we get, $t = 2\sqrt{2}$s

143. **(4)** Let the time for the particle executing SHM be noted when particle is at the extreme position.

Here, a = 10 cm, T = 12s.

When particle moves from extreme position to a position for which displacement y_1 = 5cm, then time (= t_1) is

$$y_1 = a\cos\frac{2\pi}{T}t_1 \quad \text{or} \quad 5 = 10\cos\frac{2\pi}{12}t_1$$

$$\text{or} \quad \cos\frac{2\pi}{12}t_1 = \frac{1}{2} = \cos\frac{\pi}{3} \quad \text{or} \quad \frac{2\pi}{12}t_1 = \frac{\pi}{3} \quad \text{or}$$

t_1 = 2s

When particle moves from extreme position to a position for which displacement $y_2 = -5$cm, then time (= t_2) is

$$y_2 = a\cos\frac{2\pi}{T}t_2 \quad \text{or} \quad -5 = 10\cos\frac{2\pi}{12}t_2$$

$$\text{or} \quad \cos\frac{2\pi}{12}t_2 = -\frac{1}{2} = \cos\frac{2\pi}{3} \quad \text{or} \quad \frac{2\pi}{12}t_2 = \frac{2\pi}{3}$$

or t_2 = 4s

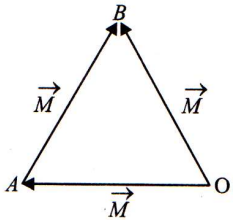
$\therefore$ time taken by particle to go from 5cm to –5cm will be = $t_2 - t_1 = 4 - 2 = 2$s.

144. **(3)** According to triangle law of vectors

$$\overrightarrow{OA} + \overrightarrow{AB} = \overrightarrow{OB}$$

$$\therefore (\overrightarrow{OA} + \overrightarrow{AB}) + \overrightarrow{OB} = \overrightarrow{OB} + \overrightarrow{OB} = 2\overrightarrow{OB}$$

= 2M, along $\overrightarrow{OB}$



145. **(2)** Motional *e.m.f.* across PQ

$V = Bl\upsilon = 4\ (1)\ (2) = 8$ volt

This is the potential to which the capacitor is charged.

As $q = CV$

$\therefore\ q = (10\times10^{-6})8 = 8\times10^{-5}\,\text{C} = 80\ \mu\text{C}.$

As magnetic force on electron in the conducting rod PQ is towards Q, therefore, A is positively charged and B is negatively charged

i.e., $q_A = +80\,\mu\text{C}$

and $q_B = -80\,\mu\text{C}$

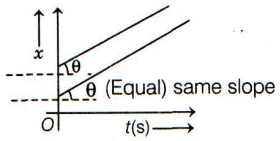
146. **(4)**

$\rho_1 < \rho_2$ as denser liquid acquires lowest position of vesel. $\rho_3 < \rho_1$ as ball sinks in liquid 1 and $\rho_3 < \rho_2$ as ball doesn't sink in liquid 2, so

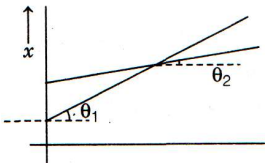
$\rho_1 < \rho_3 < \rho_2$

147. **(2)**

A. For equal velocities, the slope of the straight lines must be same as shown below.



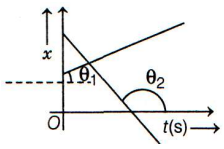
B. For unequal velocity, slope is different, but since, the object are moving in the same direction, the slope for both the graphs must be of same sign (positive or negative) and they meet at a point as shown below.



C. For velocities in opposite direction, slopes must be of opposite sign. Slope = tan θ, where θ is the angle of the straight line with horizontal in anti-clockwise direction. As, we know $\tan\theta_1 > 0, \tan\theta_2 < 0$.

Hence, slopes are of opposite sign.

This condition is shown below.



Hence, A–2, B–1 and C–3

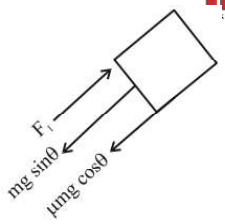
148. **(2)** $\left(5\sqrt{3}N\right)$

$f_K = \mu mg\cos\theta$

$= 2.5\sqrt{3}\text{N}$

$= 0.1\times\dfrac{50\times\sqrt{3}}{2}$

$F_1 = mg\sin\theta + fk$

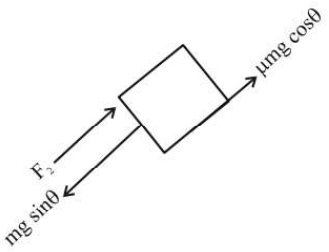


$= 25 + 2.5\sqrt{3}$

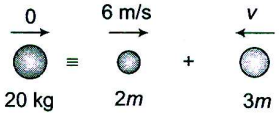
$F_2 = mg\sin\theta - f_k$

$= 25 - 2.5\sqrt{3}$

$\therefore F_1 - F_2 = 5\sqrt{3}\text{N}$



149. **(1)**



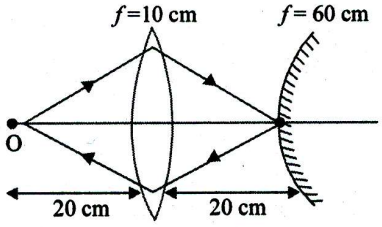
$0 = 8\times6 + 12\times v$

$v = -4$ m/s

Kinetic energy $= \dfrac{1}{2}\times12\times16 = 96$ J

150. **(2)** Object is at a distance of $2f_l$ from the lens

If the mirror is placed co-axially at a distance of $2f_l = 20$cm from the lens then the rays emerging out of lens will fall on the pole of mirror.



These rays will get reflected symmetrically to other side as shown below and therefore final therefore image will coincide with the object.

CHEMISTRY

SECTION - A (35 Questions)

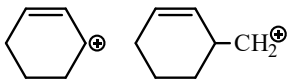
151. **(3)** As temperature ↑, $[H^+]$ and $[OH^-]$ both ↑

152. **(4)** There are certain ligands which have two or more donor atoms but in forming complexes only donor atoms is attached to metal ion, such ligands are called ambidentate ligands.

$M\leftarrow NO_2$ $M\leftarrow ONO$

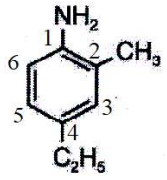
$M\leftarrow SCN$ $M\leftarrow NCS$

153. **(4)** With $AgNO_3$ SN_1 reaction takes place when stable carbocation is formed.



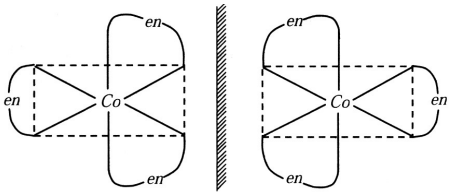
154. **(1)** Mass independent properties (molar conductivity and electromotive force) are intensive properties. Resistance and heat capacity are mass dependent, hence extensive properties.

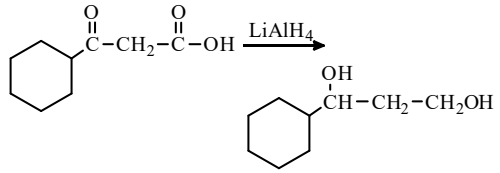
155. **(1)** Tetraammine dichloro platinum (iv) tetrachloro platinate (ii)

156. **(1)** 

4-Ethyl-2-methylaniline

157. **(4)** $n = 2, l = 1, m = 0, s = +\frac{1}{2}$

158. **(3)** 

159. **(2)** 

160. **(4)** Since the process is at equilibrium $\Delta G = 0$ for $\Delta G = 0$, the should be $\Delta H > 0$, $\Delta S > 0$.

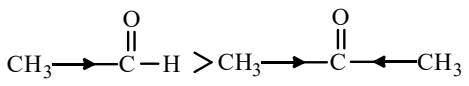
161. **(3)** Large size of phosphorus

162. **(2)** a-ii, b-i, c-iii, d-iv

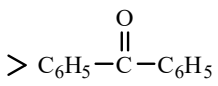
163. **(4)** For most soluble salt, solubility should be maximum.

164. **(2)** $TiCl_3 \rightarrow$ Ziegler-Natta polymerization
$PdCl_2 \rightarrow$ Wacker process
$CuCl_2 \rightarrow$ Deacon's process
$V_2O_5 \rightarrow$ Contact process

165. **(3)** Reaction of PhMgBr with carbony compounds is an example of nucleophilic addition on carbonyl group which increases with the increase in electron-deficiency of carbonyl carbon and less steric hindrance on carbonyl carbon.
Thus acetaldehyde is most reactive active while $C_6H_5COC_6H_5$ least



supplies least electron to group



supplies electrons maximum due to +M effect of C_6H_5

166. **(2)** 2, 5, 2, 10

167. **(3)** O > F > N > C

168. **(3)** $CH_3–CH=C=CH–CH_3$

169. **(3)** As Cr^{3+} Fe^{2+} Ni^{2+}, Mn^{2+} have 3, 4.2, 5 unapired electron respectively.

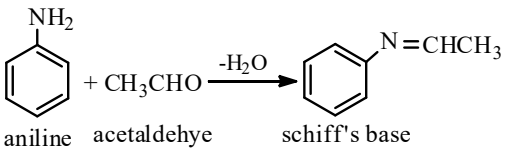
170. **(2)** Factual statement.

171. **(1)** This is correct order for acidic nature (ortho effect)

172. **(2)** In case of first order reaction, rate constant (k) = s^{-1}.

173. **(2)** Due to $\ell p - \ell p$ repulsions, bond angle in H_2O is lower (104.5°) than that in NH_3 (107°) and CH_4 (109° 28'). BeF_2, on the other hand, has sp-hybridization and hence has a bond angle of 180°.

174. **(1)** Aniline or any 1° amine reacts with aldehyde to form Schiff's base or anils.



175. **(3)** ΔH° of the reaction is the difference of energy of products and reactants.

176. **(2)** $CH_3CH_2CH_2Br \xrightarrow[\Delta]{\text{alc.KOH}} CH_3CH=CH_2$
$\xrightarrow[\text{(ii) } Zn, H_2O]{\text{(i) } O_3} CH_3CHO + CH_2O$

177. **(3)** If Assertion is True but the Reason is False

178. **(4)** $Cu^{\ominus} + e^- \longrightarrow Cu$, $E_1^{\ominus} = x_1$ V ...(i)

$Cu^{2+} + 2e^- \longrightarrow Cu$, $E_2^{\ominus} = x_2$ V .... (ii)

Net equation

$Cu^{2+} + e^- \longrightarrow Cu^{\oplus}$, $E_3 = ?$ .... (iii)

Is obtained by equations (ii) – (i)

$$\therefore \quad E_3 = \frac{n_2E_2 - n_1E_1}{n_3}$$

$$= \frac{2 \times x_1 - 1 \times x_1}{1} = 2x_2 - x_1$$

179. **(2)** $Zn + Cu^{2+} \longrightarrow Cu + Zn^{2+}$

$$\therefore \quad E_1 = E^\circ + \frac{0.059}{n} log \frac{[Cu^{2+}]}{[Zn^{2+}]}$$

On substituting the conc. of Cu^{2+} and Zn^{2+} in above expression, we get $E_1 > E_2$.

180. **(1)** Boiling point

$= T_0$ (solvent) $+ \Delta T_b$ (elevation in b.p)

$\Delta T_b = mi K_b$

where, m is the molality ($\approx$ molarity m)

i is the van't Hoff factor = [1 + (y – 1) x]

K_b, molal elevation constant.

Thus, $\Delta T_b \alpha i$

On assuming 100% ionization

(1) Mi (glucose) = 0.05

(2) Mi (KNO_3) = 0.01 × 2 = 0.02

(3) Mi (urea) = 0.015

(4) Mi (Na_2SO_4) = 0.01 [1 + (y – 1)x] = 0.03

181. **(2)** In CuF_2, Cu^{2+} ion has one unpaired electron and is coloured.

182. **(2)** sulphur only

183. **(2)** 1 mole of CH_4 contains 4 mole of hydrogen atom i.e. 4g atom of hydrogen.

184. **(1)** Actinoids form more stable complexes than lanthanoids.

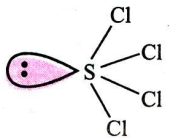
185. **(1)** (1) $CH_2=CH-CH_3 \xrightarrow{H_2O/H^+} CH_3-\underset{OH}{CH}-CH_3$

(2) $CH_3-\overset{O}{\overset{\|}{C}}-H \xrightarrow[H_2O]{CH_3MgI} CH_3-\underset{OH}{CH}-CH_3$

SECTION - B (Attempt Any 10 Questions)

186. **(1)** TTFTT

187. **(4)**



See-saw shape

188. **(2)** $CH_3-\underset{OH}{CH}-CH_3 \xrightarrow{[O]} CH_3-\overset{O}{\overset{\|}{C}}-CH_3$ (C_3H_6O)

$\xrightarrow[\text{Haloform Reaction}]{I_2 + NaOH} CHI_3$

189. **(1)** Applying $\underset{(NaOH)}{N_1V_1} = \underset{(H_2SO_4)}{N_2V_2}$

$$\frac{1}{10} \times 15 = N_2 \times 12$$

$$N_2 = \frac{15}{10 \times 12} = 0.125$$

Normality × Eq. mass = Strength (g/L)

Strength = 0.125 × 49 = 6.125 g/L

190. **(4)** $CH_3CHO + HCN \rightarrow CH_3CHOHCN$

$\xrightarrow{\text{hydrolysis}} CH_3CHOHCOOH$

D + L isomer of lactic acid

191. **(3)** Torsional strain in ethane is minimum at dihedral angles 60°, 180° and 300°

192. **(1)** Statement I and Statement II both are correct

193. **(4)** X for $AlCl_3 = \frac{1}{2}$ [Ve + MA – c + a]

$= \frac{1}{2}$ [3 + 3 – 0 + 0] = 3.

$\therefore$ State of hybridization of Al in $AlCl_3 = sp^2$

$\therefore$ $AlCl_3$ is a planar trigonal molecule. Similarly, it can be is sp^3 while that of Cl in ClF_3 is sp^3d.

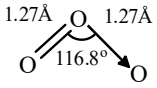
194. **(2)** $C_6H_5\text{-}NH_2 \xrightarrow[0\text{-}5^oC]{NaNO_2/HCl}$ $N_2^+ Cl^-$

$\xrightarrow{Cu_2(CN)_2}$ CN

$\xrightarrow{H_2O/H^+}$ COOH

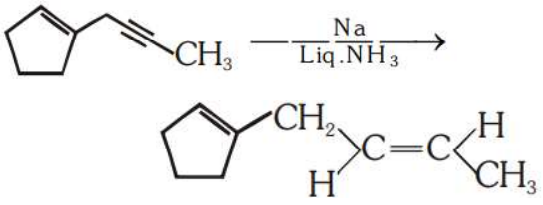
195. **(3)** $PbSO_4 + 2e^- \rightarrow Pb + SO_4^{2-}$

196. **(3)**



The bond length is intermediate between that for a single bond (1.48Å as in H_2O_2) and for a double bond (1.21 Å as in O_2)

197. **(2)**



198. **(4)** C = 24 gm, H = 4 gm, O = 32 gm

So, Molecular formula = $C_2H_4O_2$

So, Empirical formula = CH_2O

(Simplest formula).

199. **(2)** Total no. of electrons in CO = 6 + 8 = 14

in NO = 7 + 8 = 15 in O_2^{2-} = 2 × 8 + 2 = 18

in CN^- = + 6 + 7 + 1 = 14.

Only NO has odd number of electrons and hence is paramagnetic.

200. **(1)** α-D-glucose and β-D-glucose are enantiomers