1. Applying loop law at output port,
   \[ 9 - 4 = I_C R_C \quad I_C = 2.5 \text{mA} \]

   \[ I_b = \frac{I_C}{\beta} = \frac{2.5}{90} = 2.78 \times 10^{-5} \quad A = 27.8 \mu A \]

   Since, the transistor operates in active region, therefore \( V_{BE} = 0.7V \).

   Applying loop law at input circuit, \( I_n = \frac{3 - 0.7}{R_n} \)

   \[ R_n = \frac{2.3 \times 10^5}{2.78} = 82k\Omega \]

2. We know that, \( Q = \frac{1}{2} nR\Delta T \)

   Amount of heat required \( Q = \frac{3}{2} \times \frac{1}{4} \times k_B N_a \Delta T = \frac{3}{8} N_a k_B (T_2 - T_1) \)

3. \[ L - x \]
   \[ F_1 \quad R \quad F_2 \]

   \[ F_1 (L-x) = F_2 x \]

   \[ F_2 \left( \frac{3L}{4} - x \right) = F_1 \left( x + \frac{L}{4} \right) \]

   \[ \frac{3L}{4} = x + \frac{3x}{4} + \frac{x}{4} = 2x \Rightarrow 3L = 8x \]

   So putting the value of \( x \)

   \[ F_1 \left( \frac{5L}{8} \right) = F_2 \left( \frac{3L}{8} \right) \Rightarrow F_1 : F_2 = 3:5 \]

4. Accelerations of both the balls are \( a_1 = g \sin \theta \) and \( a_2 = -g \sin \theta \) down the incline.

   Ball 1: \[ \frac{l}{2} = (0)t + \frac{1}{2} g \sin \theta t^2 \quad \cdots (1) \]

   Ball 2: \[ \frac{l}{2} = v_f t + \frac{1}{2} (-g \sin \theta) t^2 \quad \cdots (2) \]

   Adding eqn. (1) and (2), we get \( l = v_f t \) or \( t = \frac{l}{v_f} \)

   Substituting it in eqn. (1), we get \( \frac{l}{2} = \frac{1}{2} g \sin \theta \left( \frac{l}{v_f} \right)^2 \) or \( v_f = \sqrt{g l \sin \theta} = \sqrt{g h} \)
5. For equilibrium $T' = 2T$
   From figure, $N = T + T$
   $N = 2T + T$
   $\Rightarrow N = 3T \quad \cdots (i) \quad \text{and} \quad N = 600 - T \quad \cdots (ii)$
   $\Rightarrow \frac{600}{4} = 150N$

6. Since the block is held against a wall, the coefficient of friction will be equal to the weight of the block. Hence
   $\mu = \frac{mg}{9.8} = 0.1 \times 9.8 = 0.98$ N

7. At any angular position $\theta$
   $T - mg \cos \theta = \frac{mv^2}{r}$
   $\Rightarrow T = mg \cos \theta + \frac{mv^2}{r}$
   When mass is released from displaced position, $\theta$ starts decreasing and $v$ starts increasing. As a result $mg \cos \theta$ as well as $\frac{mv^2}{r}$ both increases. Hence graph will be (d), (c) is not acceptable because at $t = 0$, $T \neq 0$.
   (b) is not acceptable because the variation is not linear.

8. $\therefore 2\theta = \phi \quad \Rightarrow 2\left(\frac{d\theta}{dt}\right) = \left(\frac{d\phi}{dt}\right) \Rightarrow 2\omega_A = \omega_c \Rightarrow \frac{\omega_A}{\omega_c} = 1:2$
9. \[ F = \frac{\alpha}{v} \]
\[ \Rightarrow m \frac{dv}{dt} = \frac{\alpha}{v} \Rightarrow \int mvdv = \frac{\alpha}{2} \int dt = \frac{mv^2}{2} \]
\[ \Delta KE = \alpha \Delta t = \text{Work done} \]

10. At top point net linear momentum = \( mv \cos \theta \)
    After collision assume velocity of second piece be \( v_0 \), then
    \[ mv \cos \theta = \frac{m}{2} \times v \cos \theta + \frac{m}{2} \times v_0 \Rightarrow v_0 = 3v \cos \theta \]

11. \[ M/4 \]

\[ X_{cm} = \frac{M \times O - M \times R}{4 \times M} = -\frac{R}{3} \]

12. By conservation of angular momentum \( Mr^2 \omega = (Mr^2 + 2mr^2) \omega' \)
    \[ \omega' = \frac{M \omega}{M + 2m} \]

13. \[ \vec{v}_{R/M} = \vec{v}_{R/G} - \vec{v}_{M/G} \]
    \[ -4i = \vec{v}_{R/G} - (2i + 3j) \]
    \[ \vec{v}_{R/G} = 2i - j \]
    When man starts running down \( \vec{v}_{M/G} = -(2i + 3j) \)
    \[ \vec{v}_{R/M} = \vec{v}_{R/G} - \vec{v}_{M/G} = (2i + j) - (2i + 3j) = 4i + 2j \]
    Speed \( |\vec{v}_{R/M}| = \sqrt{16 + 4} = \sqrt{20} \text{ m/s} \)

14. Since velocity of top end is twice the center so it will travel twice the distance travelled by the center.

15. We can assemble three similar triangular plates to form a square. The moment of inertia for complete square
    \[ 4I = \frac{(4M)a^2}{6} \Rightarrow I = \frac{Ma^2}{6} \]
16. \( V_0 = \sqrt{2gR} = \sqrt{2\frac{GM}{R^2}} R \) or \( V_e \approx \sqrt{\frac{M}{R}} \)

Mass is 1000 times and radius is 10 times. Therefore, escape velocity will become 10 times.
\( V_e = 11.2 \times 10 = 112 \text{ km/s} \)

17. \[ e_1 = \left( \frac{L}{2L} \right) \times \left( \frac{2r}{r} \right)^2 \]
\[ \therefore e_2 = 0.5mm \]

18. \( \alpha_{\text{effective}} = \frac{l_1 \alpha_1 + l_2 \alpha_2}{l_1 + l_2} \)

19. \( \rho_a + \frac{1}{2} \rho V_a^2 + \rho gh_a = \rho_a + \frac{1}{2} \rho V_b^2 + \rho gh_b \)

Here, \( h_a = h_b \)
\( P_a + \frac{1}{2} \rho V_a^2 = P_b + \frac{1}{2} \rho V_b^2 \)
\[ \Rightarrow \rho_a - \rho_b = \frac{1}{2} d \left( V_b^2 - V_a^2 \right) \]

Now, \( V_a = 0, V_b = r\omega \), so \( \rho_{\text{gas}} = \frac{1}{2} \rho V_b^2 \)
\[ hpg = \frac{1}{2} pr^2 w^2 \]

20. For perfectly black body, \( \lambda_m \propto \frac{1}{T} \)

So, graph is rectangular hyperbola as shown in option (4).

21. As : \( dx = a \cos \omega t \, dt \) and \( dy = a \sin \omega t \, dt \)
\[ ds = \sqrt{(dx)^2 + (dy)^2} \text{ or } ds = a \omega \, dt \]
Thus \[ \int ds = a\omega \int_0^t dt \]
\[ s = a \omega t \]

22. From Rutherford-Soddy’s law, the fraction left after \( n \) half-lives is
\[ n = \frac{\text{Time}(t)}{\text{Half life}(T_{1/2})} = \frac{2}{4} = \frac{1}{2} \cdot \frac{N}{N_0} = \left( \frac{1}{2} \right)^{\frac{1}{2}} \Rightarrow \frac{N}{N_0} = \frac{1}{\sqrt{2}} \]
23. Here, \( y = A \cos \omega t \)

When \( y = A/2 \), we find \( \cos \omega t = \frac{1}{2} = \cos \frac{\pi}{3} \)

Hence \( \omega t = \frac{\pi}{3} \)

or \( t = \frac{\pi}{3\omega} = \frac{\pi}{3 \times 2\pi / T} = \frac{T}{6} \)

24. \( \frac{v}{4l} = \frac{3v}{2l} \)

\( l = 6l \)

\( l' = 6 \times 20 \)

\( l' = 120 \text{ cm} \)

25. Gauss’ law states that the net electric flux through any closed surface is equal to the net charge inside the surface divided by \( \varepsilon_0 \)

i.e. \( \phi_{\text{total}} = \phi_A + \phi_B + \phi_C \)

Since, \( \phi_C = \phi_A \)

\( \therefore 2\phi_A + \phi_B = \phi_{\text{total}} = \frac{q}{\varepsilon_0} \)

or \( \phi_A = \frac{1}{2} \left( \frac{q}{\varepsilon_0} - \phi_B \right) \)

But \( \phi_B = \phi \) [given]

Hence, \( \phi_A = \frac{1}{2} \left( \frac{q}{\varepsilon_0} - \phi \right) \)

26. **Weight of block**

\[ = \text{Weight of displaced oil} + \text{Weight of displaced water} \]

\[ \Rightarrow mg = V_1 \rho_\text{og} g + V_2 \rho_\text{wg} g \]

\[ \Rightarrow m = (10 \times 10 \times 6) \times 0.6 + (10 \times 10 \times 4) \times 1 = 760 \text{ gm}. \]
28. Charge = Area under the current-time graph
   \[ q_1 = 2 \times 1 = 2, q_2 = 1 \times 2 = 2 \]
   and \[ q_3 = \frac{1}{2} \times 2 \times 2 = 2 \]
   \[ q_1 : q_2 : q_3 = 2 : 2 : 2 = 1 : 1 : 1 \]

29. Resistance, \( R = \frac{V^2}{P} \Rightarrow P \propto V^2 \), required voltage is 220V

   But p.d. across each bulb is \( \frac{110}{2} = 55V \)
   So, p.d. reduced to \( \frac{1}{4} \)th and power reduced to \( \frac{1}{16} \)th
   \[ \therefore \text{Power in a single bulb} = 31.25 \text{ W} = \frac{500}{16} \text{ W} \]

30. \( qvB = \frac{mv^2}{r} \) or \( r = \frac{mv}{qB} \)

   \[ PQ = 2r \cos 45^\circ \]

   \[ PQ = \sqrt{2}r = \sqrt{2} \times \frac{mv}{qB} \]

   \[ PQ = \frac{1.41 \times 1.6 \times 10^{-27} \times 10^7}{1.6 \times 10^{-19} \times 1} = 0.141m \]
\[
PQ = \sqrt{2}r = \sqrt{2} \frac{mv}{qB}
\]

\[
PQ = \frac{1.41 \times 1.6 \times 10^{-27} \times 10^7}{1.6 \times 10^{-10} \times 1} = 0.141m
\]

31. As revolving charge is equivalent to a current, so

\[\Rightarrow qf = q \times \frac{\omega}{2\pi}\]

But \[\omega = \frac{v}{R}\]

where, \(R\) is radius of circle and \(v\) uniform speed of charged particle.

Therefore, \(I = \frac{qv}{2\pi R}\)

Now, magnetic moment associated with charged particle is given by

\[
\mu = \frac{qv}{2\pi R} \times \pi R^2 = \frac{1}{2} qvR \quad \text{or} \quad \mu = I\Lambda = I \times \pi R^2
\]

32.

33. If thermal resistance of each rod is considered \(R\) then, the given combination can be redrawn as follows

\[
\frac{120 - 20}{2R} = \frac{120 - \theta}{R} \quad \Rightarrow \theta = 70^\circ C
\]
34. By using Kirchoff’s junction law as shown below.

35. The simplified circuit is shown in figure below.

\[ Y = A \cdot B \cdot C \]

So, output \( Y = \overline{A \cdot B \cdot C} \) If \( A = 0, B = 1, C = 1 \)
\[ \therefore Y = \overline{0}, \overline{1}, \overline{1} = 1.0.0 = 0 \]

39. \[
S = \frac{(\mu - 1)\beta}{t}
\]

\[
30\beta = \frac{(\mu - 1)\beta}{t}
\]

\[
(\mu - 1) = \frac{30\lambda}{t}
\]

\[
\mu = 1.5
\]

40. Here, \( V = V_0 i, B = B_0 j \)

Force on moving electron due to magnetic field is

\[
F = -e(v \times B) = -e \left[ V_0 i \times B_0 j \right] = -eV_0 B_0 k
\]

As this force is perpendicular to \( v \) and \( B \), so the magnitude of \( v \) will not change, i.e. momentum \((=mv)\) will remain constant in magnitude. Hence, de-Broglie wavelength \( \lambda = h/mv \) remains constant.

36. We know that, average power \( P_{av} = V_{rms} \times I_{rms} \cos \phi \)

\[
P_{av} = \frac{1}{2} \times \frac{1}{2} \times \cos 60^\circ = \frac{1}{8} W
\]

37. \[ C = \frac{E_0}{B_0} \Rightarrow B_0 = \frac{E_0}{C} = \frac{18}{3 \times 10^6} \]
38. Angle of deviation \( \delta = (n - 1) A \)

Dispersion produced by both the prism will be equal \((n_1 - 1) A_1 = (n_2 - 1) A_2\)

\[
A_2 = \frac{(n_2 - 1) A_1}{(n_2 - 1)} = \frac{(1.54 - 1) \times 4}{(1.72 - 1)} = 3°
\]

Hence, the angle of prisms \(P_2\) is \(3°\)

39. \( S = \frac{(\mu - 1) \beta}{t} \)

\[
30\beta = \frac{(\mu - 1) \beta}{t}
\]

\[
(\mu - 1) = \frac{30\lambda}{t}
\]

\(\mu = 1.5\)

40. Here, \(V = V_0 i, B = B_0 j\)

Force on moving electron due to magnetic field is

\[
F = -e(v \times B) = -e \left[ V_0 i \times B_0 j \right] = -eV_0 B_0 k
\]

As this force is perpendicular to \(v\) and \(B\), so the magnitude of \(v\) will not change, i.e. momentum \((=mv)\) will remain constant in magnitude. Hence, de-Broglie wavelength \(\lambda = h/\mu v\) remains constant.

41. Stopping potential = Maximum KE

\(eV = KE_{\text{max}}\)

42. \(E_1 - E_2 = 47.2\text{eV}\)

\[
\left[ \frac{-13.6}{3} - \frac{-13.6}{2} \right] n^2 = 47.2
\]

\[
n^2 \left[ \frac{-13.6}{9} + \frac{13.6}{4} \right] = 47.2 ; \quad n^2 [ -15 + 3.4 ] = 47.2
\]

\[
n^2 [1.9] = 47.2
\]

\[
n^2 \frac{47.2}{1.9} = 24.8 = 25
\]

\[
n = \frac{\text{Time(t)}}{\text{Half life(T/2)}} = \frac{2}{4} = \frac{1}{2}
\]

43. 
\[ B_1 = B_2 = B_3 = B_4 = 0 \]
\[ B_2 = \frac{\mu_0 \theta_i}{4\pi} \frac{1}{3r} \]
\[ B_4 = \frac{\mu_0 \theta_i}{4\pi} \frac{2r}{2r} \]
\[ B_5 = \frac{\mu_0 \theta_i}{4\pi} \frac{1}{r} \]

\[ \text{Net magnetic field at } O. \]

\[ B_{net} = B_2 - B_4 + B_5 = \frac{\mu_0 \theta_i}{4\pi} \frac{1}{3} \left( \frac{1}{2} - 1 + 1 \right) = \frac{5\mu_0 \theta_i}{24\pi} \]

44. Polarity of emf will be opposite in the two cases while entering and while leaving the coil. Only in option (2) polarity is changing.

45.

Initially : Resistance of given cable
\[ R = \frac{l}{\pi \times (9 \times 10^{-3})^2} \] ... (i)

Finally : Resistance of each insulated copper wire is
\[ R' = \frac{l}{\pi \times (3 \times 10^{-3})^2} \]

Hence equivalent resistance of cable
\[ R_{eq} = \frac{R}{6} = \frac{l}{6} \times \left( \frac{1}{\pi \times (3 \times 10^{-3})^2} \right) \] ... (ii)

On solving equation (i) and (ii) we get \( R_{eq} = 7.5 \, \Omega \)

46.

\[ \therefore \text{ Mass of } 22400 \, \text{cm}^3 \, \text{CH}_4 = 16 \, \text{g} \]

\[ \therefore \text{ Mass of } 112 \, \text{cm}^3 \, \text{CH}_4 = \frac{16 \times 112}{22400} = 0.08 \, \text{g} \]

47.

\[ 3F^- = 1 \text{Formula unit (AlF}_3\text{)} \]
\[ 3.0 \times 10^{24} \, F^- = 1 \times 10^{24} \text{ Formula units (AlF}_3\text{)} \]

48.

In a chemical reaction, coefficient represents mole of that substance.
\[ X + 2Y \rightarrow Z \]

This indicates 1 mole of \( X \) reacts with 2 moles of \( Y \) to form 1 mole of \( Z \).

So, 5 moles of \( X \) will require 10 moles of \( Y \). But we have taken only 9 moles of \( Y \).

Hence, \( Y \) is in limiting quantity. Hence, we determine product from \( Y \).

Thus, 5 moles of \( X \) react with 9 moles of \( Y \) to form 4 moles of \( Z \).
Mass of 1 atom = \(1.8 \times 10^{-22}\) g

Mass of \(6.02 \times 10^{23}\) atoms

\[= 6.02 \times 10^{23} \times 1.8 \times 10^{-22}\] g

\[= 6.02 \times 1.8 \times 10\] g

\[= 108.36\] g

\(\therefore\) Atomic mass of element = 108.36

50. ()

51. \(P \propto \frac{1}{V} \propto T\)

Thus, \(P_4 > P_3 > P_2 > P_1\)

52. Ideal gas equation

\[pV = nRT\]

\[pV = \frac{w}{M}RT = \frac{8}{32}RT\]

\[pV = \frac{RT}{4}\]

53. \[\frac{1}{\lambda} = Z^2 \cdot R_H \left( \frac{1}{n_1^2} - \frac{1}{n_2^2} \right)\]

For \(\text{He}^+\): \[\frac{1}{\lambda} = 2^2 \cdot R_H \left( \frac{1}{2^2} - \frac{1}{4^2} \right) = 4 \times 3 = \frac{3}{16} = \frac{3}{4}\]

For \(\text{H}\): \[\frac{1}{\lambda} = 1^2 \cdot R_H \left( \frac{1}{1^2} - \frac{1}{2^2} \right) = \frac{3}{4}\]

Hence, for hydrogen the given transition corresponds to \(n = 2\) to \(n = 1\) transition,

54.

1. \(n = 4, l = 2, m_l = -2, m_s = -\frac{1}{2}\)
   \(4d\) \hspace{1cm} 4 + 2 = 6

2. \(n = 3, l = 2, m_l = 1, m_s = +\frac{1}{2}\)
   \(3d\) \hspace{1cm} 3 + 2 = 5

3. \(n = 4, l = 1, m_l = 0, m_s = +\frac{1}{2}\)
   \(4p\) \hspace{1cm} 4 + 1 = 5

4. \(n = 3, l = 2, m_l = -2, m_s = -\frac{1}{2}\)
   \(3d\) \hspace{1cm} 3 + 2 = 5

5. \(n = 3, l = 1, m_l = -1, m_s = +\frac{1}{2}\)
   \(3p\) \hspace{1cm} 3 + 1 = 4

6. \(n = 4, l = 1, m_l = 0, m_s = +\frac{1}{2}\)
   \(4p\) \hspace{1cm} 4 + 1 = 5

\(5 < 2 = 4 < 3 = 6 < 1\)

\(3p < 3d < 4d \) \hspace{1cm} \(3d < 4p = 4p < 4d\)

(Arrangement of orbitals in order of their increasing energies.)

55.
(a) $\text{CO}_2^+$, $\text{NO}_3$; triangular planar
(b) $\text{PCl}_4^+$, $\text{SiCl}_4$; tetrahedral
(c) $\text{PF}_5$: trigonal bipyramidal
$\text{Br}_2$: square pyramidal
(d) $\text{AlF}_6^3-$, $\text{SF}_6$; octahedral

56.

<table>
<thead>
<tr>
<th>Molecule</th>
<th>Structure</th>
<th>Hybridisation of central atom</th>
<th>Lone pair</th>
</tr>
</thead>
<tbody>
<tr>
<td>$\text{SF}_4$</td>
<td>$F - S - F$</td>
<td>$sp^3d$</td>
<td>one</td>
</tr>
<tr>
<td>$\text{CF}_4$</td>
<td>$F - C - F$</td>
<td>$sp^3$</td>
<td>zero</td>
</tr>
<tr>
<td>$\text{XeF}_4$</td>
<td>$F - Xe - F$</td>
<td>$sp^3d^2$</td>
<td>two</td>
</tr>
</tbody>
</table>

57. 

58. For isolated system there is no transfer of energy as heat or work so according to the first law of thermodynamics
$\Delta U = q + W$
$\Delta U = 0 + 0 = 0$

59. $\text{MgCO}_3 \overset{\text{Heat}}{\rightarrow} \text{MgO} + \text{CO}_2$
The metal oxide of which is stable, has unstable carbonate.

60. 

61.

62.

63.

it involves $\pi$-donor back bonding
$-M$ effect and
$-I$ effect of Ph group
64. If acid is weak, its conjugate base (nucleophile) is strong and vice-versa.

(A) $\text{CH}_3\text{C}^+:\text{O}^-$ is a conjugate base of $\text{CH}_3\text{COH}(\text{I})$

(B) $\text{CH}_3\text{O}^-$ is conjugate base of $\text{CH}_3\text{OH}(\text{II})$

(C) $\text{CN}^-$ is a conjugate base of $\text{HCN}$ (III)

(D) $\text{H}_3\text{C}\text{-}$ is a conjugate base of $\text{H}_3\text{C}$ (IV)

65. 

66. Compound has one chiral carbon atom and one double bond thus, it has two geometrical (cis and trans) and two optical isomers.

67. 

68. 
69. 

70. 

Mole fraction of $P = \frac{3}{3 + 2} = \frac{3}{5}$

Mole fraction of $Q = \frac{2}{3 + 2} = \frac{2}{5}$

Hence, total vapour pressure

\[ = \text{mole fraction of } P \times \text{V.P. of } P + \text{mole fraction of } Q \times \text{V.P. of } Q \]

\[ = \frac{3}{5} \times 80 + \frac{2}{5} \times 60 = 72 \text{ Torr} \]

71. 

We know that, \[ \Delta T_b = \frac{1000 \times k_b \times w}{W \times M} \]

\[ M = \frac{1000 \times k_b \times w}{W \times \Delta T_b} \]

\[ \Delta T_b = \frac{1000 \times k_b \times 10}{100 \times 100} \]

\[ \Delta T_b = k_b \]

72. 
73. The reaction occurring in two steps has two activation energy peaks. The first step, being fast needs
less activation energy. The second step being slow, needs more activation energy. Therefore, second
peak will be higher than the first.

74. \[ B + 5D \longrightarrow 3A + 2C \]
\[ \frac{d[B]}{dt} = -\frac{1}{5} \frac{d[D]}{dt} = \frac{1}{3} \frac{d[A]}{dt} = \frac{1}{2} \frac{d[C]}{dt} \]

75. The reaction occurring in two steps has two activation energy peaks. The first step, being fast needs
less activation energy. The second step being slow, needs more activation energy. Therefore, second
peak will be higher than the first.
77. I₂ cannot oxidize Br⁻ to Br₂.
78. IUPAC name of [Pt(NH₃)₂Cl₂] is diamminedichloridoplatinum (II).
79. Since the two complexes differ in number of water (solvent) molecules inside and outside the coordination sphere, so they exhibit solvate isomerism.

80. 

81. The pinacol-pinacolone rearrangement involves dehydration of diols through the formation of carbocation intermediate which rearranges to more stable compound.

82. The effect of electron-withdrawing substituent in the benzene ring fastens the cannizzaro reaction.

83. 

84. It is an example of carbylamine reaction.
85. 

\[
\begin{align*}
\text{CH}_2\text{NH}_2 & \xrightarrow{\text{HNO}_2} \text{HONO} \xrightarrow{\text{Ring expansion}} \text{CH}_2\text{N} = \text{NCl} \\
& \xrightarrow{\text{H}_2\text{O}/\text{OH}^-} \text{CH}_2\text{OH}
\end{align*}
\]

86. 

\[
\begin{align*}
\text{CH}_3\text{CONH}_2 & \xrightarrow{\text{Br}} \text{CH}_3\text{CONHBr} \xrightarrow{\text{OH}^-} \text{CH}_3\text{CONBr}^- \\
& \xrightarrow{\text{K}^+} \text{CH}_3\text{NC} = \text{O} \xrightarrow{2\text{KOH}} \text{CH}_3\text{NH}_2 + \text{K}_2\text{CO}_3
\end{align*}
\]

87. ()
88. 1° alkyl halides on treatment with an alkoxide ion tend to undergo substitution to form ethers. So, sodium tert butoxide and ethyl bromide reagent is used.
89. ()
90. Isoelectric point is a pH at which Zwitter ions do not migrate towards any of the electrode. Amino acids are also Zwitter ions hence, they do not migrate under electric field at isoelectric point.
91. LW – Pg 11, 12, 13
92. BC – Pg 23
93. PK – Pg 38, 39
94. MOFP – [M]
95. ANAT – Pg 89
96. CELL – Pg 130
97. CELL DIV- After s-phase, DNA replicates, hence chromotids double
98. TRANSPORT – Pg 183
99. MINERAL – Pg 197
100. PHOTO – Pg 219
101. PHOTO – Pg 218
102. PGD – Pg 243
103. REPRO – Pg 9
104. Sexual Repro: 1280 microspore = \(\frac{1280}{4}\) MMC = 320
1 pollen chamber = \(\frac{320\text{MMC}}{4}\) = 80MMC
105. Genetics : 9 yellow round & 1 green wrinkled = parental 6 are mon parental \(\therefore 10:6\)
106. MOLECULAR : 3.2 Kbp = 3200bp ; A = 820; T= 820
\(G=C\) pair = 2380 (3200-820)
\(\therefore G = C = 2380\)
107. ENHANCEMENT = Pg 177
108. MICROBES = Taddy is made using sap from palms
109. ECOSYSTEM : Pg 242
110. BIODIVERSITY – Pg 260
111. ENVIRONMENTAL – Pg 274
112. BC – Pg 26
113. PK – Pg 33 & 34
114. CELL – Pg 137
115. CELL DIVISION – Pg 168
116. MORPHO – Pg 75
117. ANAT – Wheat is a monocot
118. Transport – If a cell looses water, its DPD increases
119. MINERAL – Pg 199
120. PHOTO – I respiration ; II- photosynthesis ; B- (arbohydrates & O₂)
121. RESPI – Pg 232
122. PGD – Pg 248
123. SEXUAL – Pg 25
124. Genetics – AaBbCc Represents intermediate skin colour
125. Molecular – 6.8 nm= 2 turns = 20bp = 40 bases

A= 20% ∴ A = 8; T = 8; G = 12; C = 12
Pentose sugar = 40; Base pairs = 20 ; phosphate grp = 40
Hydrogen bond = (8×2)+(12×3) = 52

126. ENHANCEMENT – Pg 177
127. MICROBES – Pg 184
128. ORG & POPL – Pg 230
129. ECOSYS – Pg 254
130. BIODIV- Pg 266
131. ENVIRONMENTAL – Pg 283
132. CELL – Pg 128
133. MORPHO – Pg 79
134. PHOTO – Pg 211
135. RESPI – Pg 231
136. PGD – Pg 244
137. Sexual – Pg 34
138. Genetics – Pg 91
139. Molecular – Pg 112
140. ORG & POPL – Pg 225