## [ANSWER KEY]
### MEDICAL MAJOR TEST-07

**[DATE: 04 JUNE, 2017]**

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1. The charges will repel each other.

2. Capacitance of solid & hollow metallic sphere is given by:

\[ V_2 = \frac{-kQ}{R} \quad \text{and} \quad V_1 = \frac{kQ}{R} \]

\[ AV = V_1 - V_2 = 2\frac{kQ}{R} = V \]

\[ Q = CV \quad \Rightarrow \quad C = \frac{Q}{V} \]

\[ \frac{Q}{V} = \frac{R}{2\kappa} = 2\varepsilon_0 R \]

3. (a) \[ f_2 = \frac{kQ^2}{\sigma^2} \]

(b) \[ f_c = \frac{k\sigma (\sigma / 2)}{(\sigma / 2)^2} - \frac{k(\sigma / 2)(\sigma / 2)}{(\sigma / 2)^2} \]

\[ = \frac{2k\sigma^2}{\sigma^2} - \frac{k\sigma^2}{\sigma^2} = \frac{k\sigma^2}{\sigma^2} = f \]
\[ V_n = V_8 = V_c = V_d = V_e \]

\[ \frac{k(40+q)}{6} = \frac{k(80-q)}{4} \]

\[ 160 + 4q = 480 - 6q \]

\[ q = 32 \]

\[ E_1 = \frac{1}{2} CV^2 + \frac{1}{2} CV^2 \quad \text{(initially)} \]

\[ E_2 = 0 \quad \text{(finally)} \]

\[ E_1 = \frac{1}{2} \times 8.4 \times 10^{-3} \times 250000 + \frac{1}{2} \times 8.4 \times 10^{-3} \times 250000 \]

\[ = 4.2 \times 25 \times 10 \times x^2 \]

\[ \Delta U_{E_1} - E_2 = 1050x^2 = 500 \times 0.1 \times \Delta T \times 4.2 \quad \text{(in Joules)} \]

\[ 2 \times 1050 = 210 \Delta T \]

\[ \Delta T = 5^\circ \times 2 = 10^\circ \]

\[ \frac{k(4e)q}{(x-y)^2} = \frac{k e q}{y^2} \]

\[ 2y = x - y \]

\[ y = x/3 \]
\[ Q = C_0 V_0 \]

\[ Q' + q = Q - C_0 V_0 \]

\[ \frac{Q'}{C_0} = \frac{q}{C} \]

\[ Q' + \frac{q}{C_0} = C_0 V_0 \]

\[ \theta_n = \left( \frac{C_0}{C_0 + C} \right)^n \theta_0 \]

\[ \theta'' = \left( \frac{C_0}{C_0 + C} \right) \theta' \]

\[ \theta' = \left( \frac{C_0}{C_0 + C} \right) C_0 V_0 \]

\[ \sqrt{n} = \left( \frac{C_0}{C_0 + C} \right)^n V_0 \]

\[ k_n = \frac{f}{E}(\text{between two plates}) = \theta \cdot E(\text{due to one plate}) \]

\[ k_n = \frac{\theta \cdot C}{2E_0} = \frac{\theta^2}{2AE_0} \]

\[ \chi = \frac{\theta^2}{2AE_0} \]

\[ \frac{KQ_1}{a} = \frac{KQ_2}{b} \]

\[ C_1 = \frac{\theta_1}{\sqrt{a}} \cdot \frac{\theta_2}{\sqrt{b}} = \frac{\theta_1}{q} \cdot \frac{\theta_2}{b} \cdot \frac{a}{b} = (1) \left( \frac{b}{a} \right) \]
\[
\begin{align*}
\text{12.} & \quad V_{\text{max}} = 50 \text{ V} \\
\Theta_{1, (\text{max})} &= C_1 V_{\text{max}} = 1000 \mu \text{C} \\
\Theta_{2, (\text{max})} &= C_2 V_{\text{max}} = 2000 \mu \text{C} \\
\Theta_{3, \text{max}} &= C_3 V_{\text{max}} = 2500 \mu \text{C} \\
\Theta &= \frac{\Theta_1}{C_{\text{eq}}} = \frac{1000 \mu \text{C}}{200} = 5 \times 19 \mu \text{C} = 95 \mu \text{C} \\
\frac{V}{C_{\text{eq}}} &= \frac{1}{\frac{1}{C_0} + \frac{1}{40} + \frac{1}{20}} = \frac{\frac{4}{200} + \frac{5}{10} + \frac{1}{20}}{200} = \frac{200}{19} \\
\text{13.} & \quad C \rightarrow KC \\
\text{14.} & \quad \frac{\partial^2 \varphi}{\partial C'} = \frac{\Theta^2}{\partial K} = \frac{F}{K} \\
\text{15.} & \quad C_{\text{eq}} = 2C \quad \text{(There are } \frac{1}{2} \text{ capacitance)} \\
\text{16.} & \quad \frac{\varepsilon_1}{\varepsilon_2} = \frac{\Theta_2}{\Theta_1} \frac{C_1}{C_2} = \frac{C_2}{C_1}
\end{align*}
\]
\[ C_{eq} = \frac{C + C}{3} = \frac{4C}{3} \]

\[ C_{eq} = \frac{C}{2} + \frac{C}{2} = C \]

\[ \frac{1}{C} + \frac{9}{8/9 + 8/3} = \frac{1}{1} \]

\[ \frac{1}{C} = 1 - \frac{9}{32} = \frac{23}{32} \]

\[ C = \frac{32}{23} \mu F \]

\[ \frac{C_1 \times C_2 + C_3}{C_1 + C_2} \]

\[ V = \frac{Q_0}{C_1 + C_2} = \frac{Q V_0}{C_1 + C_2} \]

\[ V_n = \frac{Q_{n0}}{C_n} = \frac{\eta \Omega}{\eta V_3 4\pi \varepsilon_0 \sigma_n} = \frac{\eta \Omega}{\eta V_3 4\pi \varepsilon_0 \sigma} = \frac{\eta^{2/3}}{4\pi \varepsilon_0 \sigma} \]

\[ V_n = \eta^{2/3} \theta V \]
\[ \frac{\sqrt{5} + 2}{2} + \frac{q^2}{(\sqrt{5})^2} = 0 \]

\[ \frac{\sqrt{5} q}{2} = -\frac{q}{2} \]

\[ q^2 = 2 \sqrt{5} q \]

\[ U = -\overrightarrow{p} \cdot \overrightarrow{E} = -pE \cos \theta \]

\[ KE = \frac{1}{2} m v^2 = \frac{1}{2} m (at)^2 = \frac{1}{2} (ma)^2 t^2 = \frac{1}{2} \left( \frac{F}{m} \right)^2 t^2 \]

\[ KE = \frac{1}{2} \frac{q^2 E^2 t^2}{m} \]

\[ C + \frac{2CCC}{2C} = C + \frac{8C}{3} = \frac{5C}{3} \]

\[ N_1 + N_2 = mg \]

\[ \frac{N_1}{4} = \frac{N_2}{3} \]

\[ \left\{ \begin{align*}
N_1 &= \frac{4mg}{7} \\
N_2 &= \frac{3mg}{7}
\end{align*} \right. \]
3.12 \[ \text{max. velocity when } f_{\text{net}} = 0 \]

\[ \mu = \tan \theta \]

\[ 0.3x = \frac{3}{4} \]

\[ x = \frac{10}{4} = 2.5 \text{m} \]

3.12 \[ mg = f_b \]

\[ 88 \left( \frac{4\pi}{3} (R^3 - r^3) \right) = 8 \left( \frac{4\pi}{3} R^3 \right) \]

\[ 80^3 = 7R^3 \]

\[ \frac{x}{R} = \left( \frac{7}{8} \right)^{1/3} = \frac{7^{1/3}}{2} \]

3.12 \[ \text{same on both cap.} \]

\[ V_1 = \frac{q}{C_1} \quad \text{and} \quad V_2 = \frac{q}{C_2} \]

\[ V_1 > V_2 \]

\[ \frac{q}{C_1} > \frac{q}{C_2} \]

\[ C_2 > C_1 \]
\( e = \frac{kq_1}{1^2} + \frac{kq_2}{2^2} + \frac{kq_3}{4^2} \)

\[ = 9 \times 10^9 \times q \left[ 1 + \frac{1}{4} + \frac{1}{16} \right] \]

\[ = 9 \times 10^9 q \left( \frac{1}{1 - \frac{1}{16}} \right) \]

\[ e = 12 \times 10^9 q \text{ N/C} \]

\[ f = \frac{1}{2L} \sqrt{\frac{I}{M}} \]

\[ \frac{1}{2L} \sqrt{\frac{T_1}{M}} = 2 \times \frac{1}{2L} \sqrt{\frac{T_2}{M}} \]

\[ T_1 = 4T_2 \]

\[ T_1 x = T_2 (L - x) \]

\[ 4x = L - x \]

\[ x = \frac{L}{5} \]

\[ q_{ef} = q \sqrt{\frac{1}{2}} m \sqrt{2} \]

\[ \vec{v} = \sqrt{\frac{2qV}{m}} \]

\[ \frac{V_1}{V_2} = \sqrt{\frac{q_1}{q_2}} = \sqrt{\frac{1}{9}} = \frac{1}{3} \]
\[ \frac{k_1 g}{\sqrt{2} q} + \frac{k_2 q}{a} + \frac{k_3 q^2}{a} = 0 \]

\[ q \left( 1 + \frac{1}{12} \right) = -9 \]  

\[ q = \frac{-\sqrt{2} q}{2 + \sqrt{2}} \]

1. \( f \) is restoring but not \( f(x) \)

41. \( E(\sqrt{2}(\cdot 2)) = (5 - 2) \)

\[ E = \frac{3 \times 10}{\sqrt{2} \times 2} = \frac{15}{\sqrt{2}} \]

42. \( \theta \)

43. \( mg = qE \)

\[ V = \frac{mg \theta}{q} \]
46. (1) Let $x$ no. of $\text{Se}^{2-}$ ions occupy ccp so $x$ octahedral voids are present and $2x$ tetrahedral voids are present and $\text{Li}^+$ ions are present in $2x$ that is all tetrahedral voids. So the formula of the crystal is $\text{Li}_2\text{Se}$.

47. (1) Forfcc, $r^+ + r^- = a/2$, $r^- = 7.2/2 - 1.6 = 2.0 \text{Å}$

48. (2)

49. (C)

50. (4)

Calculate the $\frac{r^+}{r^-}$ ratio to get the limiting ratio value and consult the table. All are correct.

51. (3)

$\text{CsCl}(8:8$ coordination$)$ transform to $\text{NaCl}$ ($6:6$ coordination) on heating but reverse is not possible.

52. (1)

Let the sample contains 93 iron ions and 100 oxide ions.

Total negative charge on oxide ions $= 2 \times 100 = 200$

Let no. of ions of iron as $\text{Fe}^{3+} = x$

No. of $\text{Fe}^{2+}$ ions $= 93 - x$
\[ x \times 3 + (93-x) \times 2 = 200. \]
\[ 3x - 186 - 2x = 200. \]
\[ x = 200 - 186 = 14. \] Percentage of iron as \( \text{Fe}^{3+} = \frac{14}{93} \times 100 = 15.05. \)

53. (4)

54. (1)

In \( \alpha \)– form distance between nearest neighbour atom is \( \frac{\sqrt{3}a_1}{2} \).

In \( \gamma \) form distance between nearest neighbour atom is \( \frac{a_2}{\sqrt{2}} \).

\[ \therefore \frac{a_1}{a_2} = \frac{2}{\sqrt{3}} \ (\text{given}) \]

or \( \frac{a_1}{a_2} = \sqrt{3} \)

\[ \rho_1 = \frac{z_1}{z_2} \left( \frac{a_2}{a_1} \right)^3 = \frac{1}{2} \left( \frac{\sqrt{3}}{2} \right)^3 = 0.918 \]

55. (1) For an octahedral void \( a = 2(r + R) \), in fcc lattice the largest void present in octahedral void

If the radius of the void sphere is \( R \) and of lattice sphere is \( r \). Then,

\[ r = 1.414 \times 400/4 = 141.4 \text{pm}. \] By applying condition of octahedral void , \( 2r + 2R = a \),

\[ D = 2R = a - 2r = 400 - 2 \times 141.4 = 117.16 \text{ pm}. \]

56. (3)

If \( \text{NaCl}(\text{Na}^+) \) is doped with \( 10^{-4} \text{ mol}\% \) of \( \text{SrCl}_2(\text{Sr}^{2+}) \), It means 100 moles of \( \text{NaCl} \) are doped with \( 10^{-4} \text{ mol} \) of \( \text{SrCl}_2 \).

\[ \therefore 1 \text{ mole of } \text{NaCl} \text{ is doped with } \frac{10^{-4}}{100} = 10^{-6} \text{ mole of } \text{SrCl}_2 \]

As each \( \text{Sr}^{2+} \) ion introduces are cation vacancy,

\[ \therefore \text{Concentration of cation vacancies} = 10^{-6} \text{ mol/mol of } \text{NaCl} \]

\[ = 10^{-6} \times 6.02 \times 10^{23} \]

\[ = 6.02 \times 10^{17} \text{ mol}^{-1} \]

57. (3)

58. (3)

\[ \Delta T = \frac{1000K_w w_1}{m_w} \]

\[ \Delta T \]

\[ \frac{K_b (AB_2)}{m_1 \times 100} = 1 \]

\[ \therefore m_1(AB_2) = 60 = A + 2B \]

\[ \Delta T \]

\[ \frac{K_b (A_2B)}{m_1 \times 100} = 1 \]

\[ \therefore m_1(A_2B) = 90 = 2A + B \]

\[ \therefore A = 40, \ B = 10 \]

59. (1)

1100 g solution has 60 g urea

Thus, water = 1040 g
\[ \Delta T_f = \frac{1000K_w}{m_1 w_1} \]
\[ \Delta T_f = \frac{1000 \times 60}{60 \times w_2} = 1 \]
\[ w_2 = 1000g \]

Thus, ice formed = 1040 – 1000 = 40g

60. (2)
\[ \Delta T_f = \frac{1000 \times 1.86 \times 0.02}{100} = 0.372°C \]

61. (1)
\[ \frac{\Delta p}{p^o} = X_{\text{solute}} = \frac{n_1}{n_1 + n_2} \]
\[ 4 = \frac{n_1}{n_1 + n_2} \]
\[ n_2 = 9n_1, \frac{w_2}{m_2} = 9n_1 \]

\[ w_2 = 9n_1 m_2 \]

\[ \text{Molality} = \frac{1000w_1}{m_1 w_2} = \frac{1000n_1}{w_2} \]
\[ = \frac{1000n_1}{9n_2} = \frac{1000}{9 \times 18} = 6.173 \text{ molal} \]

62. (4)
\[ \text{AlPO}_4 \rightleftharpoons \text{Al}^{3+} + \text{PO}_4^{3-} \]
\[ i = 2 \]
\[ \Delta T_b = \text{molality} \times K_b \times i = 0.01 \times K_b \times 2 \]
\[ \therefore \frac{\Delta T_b}{K_b} = 0.02 \]

63. (1)
\[ \pi = \frac{n}{V} = \text{MST} \]
\[ \therefore \frac{\pi}{\text{ST}} = \frac{7.4}{0.0821 \times 300} = 0.3 \text{ mol L}^{-1} \]

64. (3)
Relative decrease in vapour pressure = mole fraction of solute

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<th>Solute</th>
<th>Mole in solution</th>
<th>Mole fraction of solute</th>
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<td>A (NaCl)</td>
<td>2</td>
<td>( \frac{2}{7} = 0.29 )</td>
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<tr>
<td>B (K\textsubscript{2}SO\textsubscript{4})</td>
<td>3</td>
<td>( \frac{3}{8} = 0.38 )</td>
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<tr>
<td>C (Na\textsubscript{3}PO\textsubscript{4})</td>
<td>4</td>
<td>( \frac{4}{9} = 0.44 )</td>
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<tr>
<td>D (Glucose)</td>
<td>1</td>
<td>( \frac{1}{6} = 0.17 )</td>
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65. (4)
Van’t Hoff factor for NaCl = 1 + x = 1 + 0.8 = 1.8
Van’t Hoff factor for MgCl\textsubscript{2} = 1 + 2x = 1 + 2 \times 0.5 = 2.0
66. (2)
\[ \text{pH} = 2 \]
\[ [\text{H}^+] = 10^{-2} \text{M} \]
\[ \therefore \ C_x = 0.1 \times x = 0.01 \]
\[ \therefore \ x = 0.1 \]
\[ \therefore \ i \text{ for monobasic acid} = 1 + x = 1.1 \]
\[ \therefore \ \pi = MRT \ i = 0.1(RT)(1.1) \]
\[ = 0.11 \text{RT} \]

67. (1)
\[ X_B (\text{mole fraction of B in vapour phase}) \]
\[ = \frac{p_B^o X_B}{p_A^o X_A + p_B^o X_B} \]
\[ = \frac{36 \times 0.5}{108 \times 0.5 + 36 \times 0.5} \]
\[ = 0.25 \]

68. (2)
By Roault’s law
Relative decrease in vapour pressure = mole fraction of solute
\[ \frac{\Delta p}{p^o} = X_i \]
\[ \frac{10}{p^o} = 0.2 \]
In second case
\[ \frac{20}{p^o} = X_i' \]
\[ \therefore \ \frac{20}{10} = \frac{X_i'}{0.2} \]
\[ X_i' = 0.4 \]
\[ \therefore \ \text{Mole fraction of solvent} = 1 - 0.4 = 0.6 \]

69. (1)
F.P. = 0 - \Delta T_i = -\Delta T_f
Thus, greater the value of \( \Delta T \), smaller the f.p.
\[ \begin{array}{ll}
(\text{I}) & 0.05 \text{ M NaNO}_3 \\
& 1 + x = 2 \\
& 0.05 \times 2 \times K_f = 0.1 K_f \\
(\text{II}) & 0.075 \text{ M CuSO}_4 \\
& 1 + x = 2 \\
& 0.075 \times 2 \times K_f = 0.15 K_f \\
(\text{III}) & 0.14 \text{ M sucrose} \\
& 1 \\
& 0.14 \times 1 \times K_f = 0.14 K_f \\
(\text{IV}) & 0.04 \text{ M BaCl}_2 \\
& 1 + x = 3 \\
& 0.04 \times 3 \times K_f = 0.12 K_f \\
\end{array} \]
Thus, decreasing order of f.p. is I > IV > III > II

70. (3)
Among the given, solution of \( \text{CH}_3\text{CH}_2\text{OH} \) and \( \text{CH}_3\text{COCH}_3 \) is non-ideal and show positive deviation.
Hence, it has lesser boiling point.

71. (1)
\[ E^o_{\text{cell}} = E^o_{\text{Cu}^{2+}/\text{Cu}} + E^o_{\text{Ag}^+/\text{Ag}} \]
\[ = -E^o_{\text{Cu}^{2+}/\text{Cu}} + E^o_{\text{Ag}^+/\text{Ag}} \]
\[ 0.46 = -0.34 + E^o_{\text{Ag}^+/\text{Ag}} \]
72. (2)
A cell reaction is spontaneous if
\[ E_{\text{cell}}^{o} = +\text{ve} \]
\[ \text{Sn}^{2+} \rightarrow \text{Sn}^{4+} + 2e^{-} \]
\[ \text{Sn}^{2+} + 2e^{-} \rightarrow \text{Sn} \]
\[ 2\text{Sn}^{2+} \rightarrow \text{Sn}^{4+} + \text{Sn} \]

73. (1)
\[ \text{Cu} + 2\text{Ag}^{+} \rightarrow 2\text{Ag} + \text{Cu}^{2+} \]
\[ K = \left[ \frac{[\text{Cu}^{2+}]}{[\text{Ag}^{+}]^2} \right] = \frac{0.01}{(0.1)^2} = 1 \]
\[ \therefore E = E^{o} - \frac{0.0591}{2} \log K \]
\[ = 0.46 - \frac{0.0591}{2} \log 1 \]
\[ = 0.46 \text{ V} \]

74. (3)
\[ \text{Pt} \left( \text{H}_2 \right) | \text{pH} = 2 \]
\[ \text{H}_2 (g) \rightleftharpoons 2\text{H}^{+} + 2e^{-} \]
\[ K = \left[ \frac{[\text{H}^{+}]^2}{(10^{-2})^2} \right] = 10^{-4} \text{M} \]
\[ E = E^{o} - \frac{0.0591}{2} \log 10^{-4} = 0.1182 \text{ V} \]

75. (1)
\[ 2\text{H}_2 + \text{O}_2 \rightarrow 2\text{H}_2\text{O} \]
Total electrons involved = 4
\[ \therefore \Delta G^{o} = -nF \text{E}^{o} \]
\[ -475 \times 1000 = -4 \times 96500 \text{ E}^{o} \]
\[ \therefore \text{E}^{o} = 1.23 \text{ V} \]

76. (4)
77. (1)
I : \text{Fe}^{2+} + 2e^{-} \rightarrow \text{Fe} \quad E^{o}_{\text{Fe}^{2+}/\text{Fe}} = x_1
II : \text{Fe}^{3+} + 3e^{-} \rightarrow \text{Fe} \quad E^{o}_{\text{Fe}^{3+}/\text{Fe}} = x_2
III : \text{Fe}^{3+} + e^{-} \rightarrow \text{Fe}^{2+} \quad E^{o}_{\text{Fe}^{3+}/\text{Fe}^{2+}} = ?

\[ \Delta G_3 = \Delta G_2 - \Delta G_1 \]
\[ -n_3 \text{E}^{o}_{\text{Fe}^{3+}} = -n_2 \text{E}^{o}_{\text{Fe}^{2+}} + n_1 \text{E}^{o}_{\text{Fe}^{1+}} \]
\[ \text{E}^{o}_{3} = \frac{n_2 \text{E}^{o}_{2} - n_1 \text{E}^{o}_{1}}{n_3} \]
\[ = 3x_2 - 2x_1 \]
E = E^o - \frac{0.0591}{2} \log \left( \frac{C_1}{C_2} \right) = \frac{0.0591}{2} \log \frac{C_2}{C_1}

To make \Delta G = -ve, E = +ve

Hence, \quad C_2 > C_1

79. (3)
Reducing nature of Mg > Cu > Hg > Ag. Thus, order of deposition will be Ag, Hg, Cu, Mg will remain in the ionic state \[Mg^{2+}\][]

80. (2)
\[Cl^- \rightarrow \frac{1}{2} Cl_2 + e^-\]

0.355g Cl^- = 0.01 mol of Cl^- = 0.01 N_0

81. (2)
\[\Lambda_{CH,CH,COOH} = \Lambda_{CH,CH,COONa} + \Lambda_{HCl} - \Lambda_{NaCl}\]

\[= 390.71 \text{ ohm}^{-1} \text{ cm}^2 \text{ equiv}^{-1}\]

82. (1)
Sets of quantum number are possible if \( l < n \) and \( m \) is between \(-l\) to \( l\) (with +1 difference) and spin \( \pm \frac{1}{2} \) or \(-\frac{1}{2}\).

83. (4)
On applying \[N_1 V_1 = N_2 V_2\]

Or \[M_1 V_1 = M_2 V_2\]

\[\therefore 12 V_1 = 18 \times 240\]

\[V_1 = \frac{18 \times 240}{12} = 360 \text{ mL} = 0.36 \text{ L}\]

84. (1)

85. (2)
\[(CH)_2(COOH)_2\] in fact represents
HOOC - CH = CH - COOH

And hence shows geometrical isomerism.

86. (1)
In case of different nucleophiles, but present in the same group in the periodic table, then larger is the atomic mass, higher is the nucleophilicity. Hence the decreasing order of nucleophilicity of the halide ions is

\[\Gamma^- > Br^- > Cl^- > F^-\]

87. (3)
In presence of peroxide, the addition of HBr takes place according to Anti Markownikoff’s rule.

88. (1)

89. (4)
\[ X_{O_2} = \left( \frac{1}{1 + x} \right), P_{O_2} = \left( \frac{10}{1 + x} \right) = 2 \]
\[ \therefore \quad x = 4 \text{ mol Ne} \]

90. (4)

\[ x \propto \left( \frac{1}{p} \right)^{\Delta n/2} \]

\[ \Delta n = \text{moles of gaseous products} - \text{moles of gaseous reactants} = 1 \]

\[ x \propto \frac{1}{\sqrt{p}} \]

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**BOTANY**

91. (3) Pg.no.38
92. (3) Pg.no.28
93. (1) Pg.no.96 (XI)
94. (4) Xenia is effect of pollen on endosperm
95. (3) Pg.no.13
96. (3) Pg.no.26
97. (2) Pg.no.24
98. (1) Pg.no.36,37 (XI) (Sporophyll and spore mother cell are diploid while prothallus is haploid)
99. (4) Pg.no.28
100. (3) Pg.no.35
101. (2) Pg.no.38
102. (2) A V-shaped notch in the stock is made during wedge grafting
103. (1) Pg.no.203 (XI)
104. (3) Cellase is released by Tapetum
105. (1) Monocot pollen grains have generally a single germ pore and are hence called as monocolpate
106. (1) Pg.no.24
107. (3) \( n + n/4 = 120 = 120/4 = 120 + 30 = 150 \)
108. (3) Pg.no.35
109. (1) Pg.no.7
110. (1) Pg.no.38
111. (2) Pg.no.23,24 (XI)
112. (2) Progenitor is the one who develops into next generation
113. (2) Root cell belongs to stock thus \( 2n = 48 \) while microspores belong to scion where scion \( 2n = 24 \). Microspores being haploid will be 12
114. (2) The maturation of stamens and pistils at different times in the bisexual flower is called dichogamy
115. (2) Disintegrating tube nucleus and synergids nucleus
116. (2) Pg.no.34
117. (1) Bryophyta
118. (2) Pg.no.31
119. (1) Pg.no.134-136 (XI)
120. (1) Pg.no.29
121. (2) Pg.no.27
122. (2) \( 2nx2 = 4n \)
123. (3) Pg.no.35
124. (3) \( n/4 \)
125. (2) Pg.no.22
126. (4) Pollen kit is formed by tapetal cells
127. (4) Prothalial cells are formed by pteridophytes abd not angiosperms
128. (3) PEP is the primary acceptor of Carbon dioxide
129. (4) 2 male gamete nuclei, 2 polar nuclei and one egg nucleus
130. (4) Endothecium helps in dehiscence
131. (3) Aleurone layer is a part of endosperm and hence triploid
132. (3) Pg.no.25
133. (1) Pg.no.78-81 (XI)
134. (2) Pg.no.23
135. (2) Ramet is the individual member of clones

ZOOLOGY
136. (2) Glans penis is enlarged corpus spongiosum through which urethra passed.
137. (3) Mesometrium is the peritoneal lining of uterus to attach it to dorsal body wall.
138. (3) The cortical region shows osmomolarity of 300m Osmo/ℓ whereas osmomolarity of fluids in inner part of medulla is 1200m Osmo/ℓ.
139. (3)
140. (4) Morula is of same size as that of ovum as cleavage results in production of smaller blastomeres and still covered by zona pellucida.
141. (3) Archenteron or primitive gut is lined with endoderm.
142. (4) Spermiogenesis involves conversion of spermatid to sperm during which golgi bodies are packed as acrosome.
143. (3)
144. (4) Depolarisation of vitelline membrane eventually results in formation of fertilization membrane to prevent polyspermy.
145. (3)
146. (2)
147. (3) Menstruation causes reduction in thickness of endometrium but not complete loss.
148. (3)
149. (4) Sustentacular cells or sertoli cells are within seminiferous tubules.
150. (2)
151. (4) Corpus luteum degenerates in absence of fertilization.
152. (3) Seminal duct opens in ejaculatory duct carrying sperms.
153. (2)
154. (2) Cleavage cause no change in protoplasmic content. Size of blastomeres keep decreasing to produce hollow ball of cells called blastula.
155. (2)
156. (4) Trophoblast causes formation of amnion, Chorion, Yolk sac and allantois.
157. (4) Maternal and foetal blood never comes in direct contact.
158. (4) Tertiary follicle has secondary oocyte arrested at metaphase II. Ovary releases secondary oocyte and not ootid or mature ovum. Primary follicle is surrounded by granulosa layer.
159. (4) Notochord is mesodermal in origin
160. (4) Hippocampus belongs to Osteichthyes
161. (2)
162. (3)
163. (3) Second heart sound ‘dup’ produced due to closure of semilunar valves.
164. (1) Succus entericus or intestinal juice does not contain trypsinogen, amylpsin and amylase.
165. (3) Organisms with haplontic life cycle, zygote divides by meiosis
166. (1)
167. (2) Animals showing oestrous cycle are seasonal breeders.
168. (3)
169. (3)
170. (2) Seminal plasma + sperms = Semen / Seminal fluid
171. (3) HMM has head showing ATPase activity
172. (2)
173. (3) Vagina is included under internal genitilia
174. (2) Both secondary spermatocyte and spermatid are haploid.
175. (1) Primary oocyte undergoes Meiosis I to form secondary oocyte within tertiary follicle.
176. (2) During oogenesis, Meiosis is unequal to form large secondary oocyte and small polar body.
177. (3) 
178. (1) 
179. (2) 
180. (2)