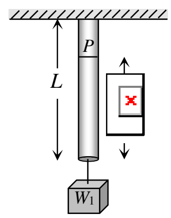
1. (c)

Sol. As the wire is uniform so the weight of wire below point P is $\frac{3W}{4}$

$\therefore$ Total force at point $P = W_1 + \frac{3W}{4}$ and area of cross-section = S

$\therefore$ Stress at point P $= \frac{\text{Force}}{\text{Area}} = \frac{W_1 + \frac{3W}{4}}{S}$



2. (c)

Sol. From the graph $\tan\theta_C < \tan\theta_B < \tan\theta_A$

$\Rightarrow Y_C < Y_B < Y_A \quad \therefore Y_{\text{Rubber}} < Y_{\text{Brass}} < Y_{\text{Steel}}$

3. (b)

Sol. Let the original length of elastic string is L and its force constant is k. When longitudinal tension 4N is applied on it $L + \frac{4}{k} = a$ .....(i)

and when longitudinal tension 5N is applied on it

$L + \frac{5}{k} = b$ .....(ii)

By solving (i) and (ii) we get $k = \frac{1}{b-a}$ and $L = 5a - 4b$

Now when longitudinal tension 9N is applied on elastic string then its length = $L + \frac{9}{k} = 5a - 4b + 9(b-a)$

$= 5b - 4a$

4. (d)

Sol. If same force is applied on four wires of same material then elongation in each wire depends on the length and diameter of the wire and given by $l \propto \frac{L}{d^2}$ and the ratio of $\frac{L}{d^2}$ is maximum for (d) option.

5. (d)

Sol. $Y = \frac{\text{Stress}}{\text{Strain}}$ $\quad\therefore$ Stress = Y × Strain $= 2\times10^{11}\times0.15 = 0.3\times10^{11} = 3\times10^{10}\,N/m^2$

6. (a)

Sol. $K = \frac{P}{\Delta V/V} = \frac{hdg}{\Delta V/V} = \frac{200 \times 10^3 \times 9.8}{0.001} = 19.6 \times 10^8\ N/m^2$

7. (b)

Sol. $\frac{dV}{V} = \frac{dL}{L} + 2\sigma\frac{dL}{L} = (1+2\sigma)\frac{dL}{L} = 0$ [As there is no change in the volume of the wire]

$\therefore 1 + 2\sigma = 0 \Rightarrow \sigma = -\frac{1}{2}$

8. (b)

Sol. $L\phi = r\theta \qquad \therefore \phi = \frac{r\theta}{L} = \frac{4 \times 10^{-3} \times 30^o}{1} = 0.12^o$

9. (c)

Sol.

$\Delta l = \frac{Fl}{AY} = \frac{4 \times 8000 \times 10 \times 2.5}{\pi(.25)^2 \times 2 \times 10^{11}} = \frac{4 \times 16 \times 10^{-5}}{\pi} = 0.21\text{mm.}$

10. (b)

Sol. B = $B = \frac{P}{\frac{\Delta V}{V}}$

11. (b)

Sol. u = $\frac{1}{2}$stress × strain = $\frac{1}{2}\ S\left(\frac{S}{Y}\right) = \frac{S^2}{2Y}$.

12. (c)

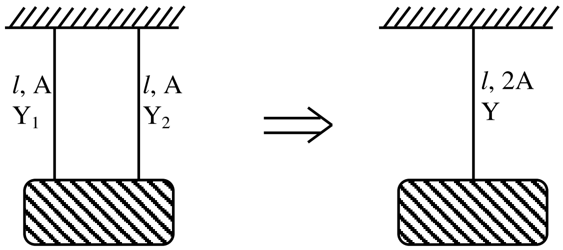
Sol. $\frac{T_1}{T_2} = \frac{l_1 - l}{l_2 - l}$ or $T_1(l_2 - l) = T_2(l_1 - l)$ or

$l = \frac{l_1T_2 - l_2T_1}{T_2 - T_1}$

13. (d)

Sol. It is proportional limit so OA is correct

14. (b)
Sol.



Equivalent spring constant of a wire is given by

$K = \frac{YA}{l}$

$K_{eq} = K_1 + K_2$

or $\frac{Y(2A)}{l} = \frac{Y_1A}{l} + \frac{Y_2A}{l}$

or $Y = \frac{Y_1 + Y_2}{2}$

15. (d)
Sol. $\frac{Y_A}{Y_B} = \frac{\tan 60^0}{\tan 30^0} = \frac{\sqrt{3}}{\frac{1}{\sqrt{3}}} = 3$

so $Y_A = 3Y_B$

16. (d)
Sol. Stress = Y ×strain = $2 \times 10^{11} \times 0.15$ Nm^{-2}

= 3×10^{10} Nm^{-2}

17. (a)
Sol. $\Delta\ell = \frac{F\ell}{(\pi r^2)Y} = y$

$\Delta\ell' = \frac{(2F)(2\ell)}{\pi(2r)^2 \times Y} = \frac{F\ell}{\pi r^2 Y} = y$

18. (a)
Sol. Thermal stress $\frac{F}{A} = Y\alpha\Delta\theta = 1.2\times10^{11}\times1.1\times10^{-5}\times(20-10) = 1.32\times10^{7}\,N/m^2$

19. (b)
Sol. Difference in lengths of rods will remain same if
expansion is same in both the rods.
If expansion in first rod is $l_1 = L_1\alpha_1\Delta\theta$ and expansion in second rod is $l_2 = L_2\alpha_2\Delta\theta$

then $L_1\alpha_1\Delta\theta = L_2\alpha_2\Delta\theta \quad \therefore L_1\alpha_1 = L_2\alpha_2$

20. (a)

Sol. Elastic energy stored in wire

$= U = \frac{1}{2}Fl = \frac{1}{2}\times 200\times 1\times 10^{-3} = 0.1J$

21. (c)

Sol. Shear stress = $\frac{F\sin\theta}{A/\cos\theta} = \frac{F\sin 2\theta}{2A}$

Shear stress will be maximum if sin 2θ = 1 or 2θ = 90^0

i.e., θ = 45^0.

22. (a)

Sol. T cos θ = mg.

Y = $\frac{TL}{A\Delta L}$ or $\Delta L = \frac{TL}{AY} = \frac{mgL}{AY\cos\theta} = \frac{4mgl}{\pi d^2 Y\cos\theta}$

23. (d)

Sol. Since tension in the two rods will be same, hence

$A_1Y_1\alpha_1\Delta\theta = A_2Y_2\alpha_2\Delta\theta$

$\Rightarrow A_1Y_1\alpha_1 = A_2Y_2\alpha_2$

24. (d)

Sol. On the graph stress is represented on X- axis and strain Y-axis So from the graph $Y = \cot\theta = \frac{1}{\tan\theta} \propto \frac{1}{\theta}$

[where θ is the angle from stress axis]

$\therefore Y_P < Y_Q < Y_R$

[As $\theta_P > \theta_Q > \theta_R$]

We can say that elasticity of wire P is minimum and R is maximum.

25. (d)

Sol. $Y = \frac{FL}{\pi r^2 l} \quad \therefore F = Y\pi r^2\frac{l}{L}$

$$\frac{F_A}{F_B} = \frac{Y_A}{Y_B}\left(\frac{r_A}{r_B}\right)^2\left(\frac{l_A}{l_B}\right)\left(\frac{L_B}{L_A}\right) = 1\times\left(\frac{2}{1}\right)^2\times(1)\times\left(\frac{2}{1}\right) = 8$$

26. (d)

Sol. Force constant of wire $k_1 = \frac{F}{l} = \frac{YA}{L}$ and force constant of spring $k_2 = k$ (given)

Equivalent force constant for given combination

$$\frac{1}{k_{eq}} = \frac{1}{k_1} + \frac{1}{k_2} = \frac{L}{YA} + \frac{1}{k} \Rightarrow k_{eq} = \frac{kYA}{kL + YA}$$

$\therefore$ Time period of combination

$$T = 2\pi\sqrt{\frac{m}{k_{eq}}} = 2\pi\sqrt{\frac{m(kL + YA)}{kYA}}$$

27. (c)

Sol. Steel is more elastic than rubber. All other statements are correct.

28. (c)

Sol. The ratio of the lateral strain to longitudinal strain is called Poisson's ratio.
Hence, option (a) is an incorrect statement.
Its value depends only on the nature of the material.
Hence, option (b) is an incorrect statement.
It is the ratio of two like physical quantities.
Therefore, it is unitless and dimensionless quantity.
Hence, option (c) is a correct statement.
The practical value of Poisson's ratio lies between 0 and 0.5.
Hence, option (d), is an incorrect statement.

29. (b)

Sol. According to Hooke's law, Within elastic limit,
Extension $\propto$ Load applied
Hence, option (b) represents the correct graph.

30. (d)

Sol. From the given graph for a stress of
$150 \times 10^{16}\,\mathrm{N\,m^{-2}}$ the strain in 0.002.

$\therefore$ Young's mod ulus $\mathrm{Y} = \frac{\mathrm{Stress}}{\mathrm{Strain}}$

$$\mathrm{Y} = \frac{150 \times 10^{6}}{0.002}\,\mathrm{N\,m^{-2}} = 7.5 \times 10^{10}\,\mathrm{N\,m^{-2}}$$

31. (d)

Sol. Force on one side of the stick $F_1 = T_1 \times L$

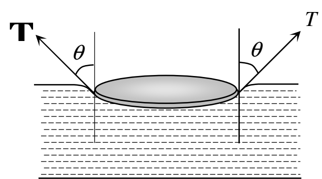
$= 0.07 \times 2 = 0.14\,N$

and force on other side of the stick $F_2 = T_2 \times L$

$= 0.06 \times 2 = 0.12 N$

So net force on the stick $= F_1 - F_2 = 0.14 - 0.12 = 0.02 N$

32. (c)
Sol. Weight of metal disc = total upward force



= upthrust force + force due to surface tension

= weight of displaced water + T cos θ (2π r)

= W + 2π rT cos θ

33. (a)
Sol. Force on wire due to surface tension $F = T \times 2l$

$\therefore T = \frac{F}{2l} = \frac{2 \times 10^{-2}}{2 \times 10 \times 10^{-2}} = 0.1\, N/m$

34. (b)
Sol.
As $R = n^{1/3} r = 2^{1/3} r \Rightarrow R^2 = 2^{2/3} r^2 \Rightarrow \frac{r^2}{R^2} = 2^{-2/3}$

$\frac{\text{Initial surface energy}}{\text{Final surface energy}} = \frac{2(4\pi r^2 T)}{(4\pi R^2 T)} = 2\left(\frac{r^2}{R^2}\right) = 2 \times 2^{-2/3}$

$= 2^{1/3}$

35. (b)
Sol. Excess pressure inside a bubble just below the surface of water $P_1 = \frac{2T}{r}$ and excess pressure inside a drop $P_2 = \frac{2T}{r}$ $\therefore P_1 = P_2$

36. (b)
Sol. The height upto which water will rise $l = \frac{h}{\cos \alpha} = \frac{2cm}{\cos 60} = 4cm$. [h = vertical height, α = angle with vertical]

37. (d)

Sol. $h = \frac{2T\cos\theta}{rdg}$ [If diameter of capillaries are same and taking value of θ same for both liquids]

$\therefore \frac{h_1}{h_2} = \left(\frac{T_1}{T_2}\right)\left(\frac{d_2}{d_1}\right) = \left(\frac{60}{50}\right) \times \left(\frac{0.6}{0.8}\right) = \left(\frac{36}{40}\right) = \frac{9}{10}$.

38. (b)

Sol. Mass of the liquid in capillary tube M = Vρ = ($\pi r^2 h$)ρ $\therefore M \propto r^2 h \propto r$ [As $h \propto \frac{1}{r}$]

So if radius of the tube is doubled, mass of water will becomes 2M, which will rise in capillary tube.

39. (d)

Sol. The lower end of capillary tube is at a depth of 12 + 3 = 15 cm from the free surface of water in capillary tube.

So, the pressure required = 15 cm of water column.

40. (c)

Sol. Under isothermal condition surface energy remain constant

$\therefore 8\pi r_1^2 T + 8\pi r_2^2 T = 8\pi R^2 T \Rightarrow R^2 = r_1^2 + r_2^2$

41. (b)

Sol. Radius of curvature of common surface of double bubble $r = \frac{r_2 r_1}{r_2 - r_1} = \frac{5 \times 4}{5 - 4} = 20\,cm$

42. (a)

Sol. $2T\ell \cos\theta = mg = \pi r^2 \ell \rho g$

$\therefore r = \sqrt{\frac{2T}{\pi \rho g}}$

43. (c)

Sol. Because mercury meniscus is convex. The pressure just inside the hole will be less than the outside pressure by $\frac{2T}{r}$

$\therefore h\rho g = \frac{2T}{r}$ or $h = \frac{2T}{r\rho g}$

44. (c)

Sol. $\frac{4}{3}\pi R^3 = n \times \frac{4}{3}$

πr^3 or $r = \frac{R}{n^{1/3}}$

Now work done = increase in area × surface tension

$= (4\pi r^2 n - 4\pi R^2) \times T = 4\pi\left(\frac{R^2}{n^{2/3}}n - R^2\right) \times T$

$\propto (n^{1/3} - 1)$

45. (d)
Sol. As temperature increases;

surface tension decreases ;

As $h = \frac{2T\cos\theta}{R\rho g}$ $\therefore$ h also decreases.

46. (a)
Sol. Increase in surface energy $= 4\pi R^2 T(n^{1/3} - 1)$

$= 4\pi(2\times10^{-3})^2(0.465)(8^{1/3} - 1) = 23.4\times10^{-6}\,J = 23.4\,\mu J$

47. (c)

Sol. Pressure inside a bubble when it is in a liquid $= P_o + \frac{2T}{R} = 1.013\times10^5 + 2\times\frac{70\times10^{-3}}{0.1\times10^{-3}} = 1.027\times10^5$ Pa

48. (a)
Sol. $W = 8\pi T\left(R_2^2 - R_1^2\right) = 8\pi S[(2R)^2 - (R)^2] = 24\pi R^2 S$

49. (a)
Sol. $h = \frac{2T\cos\theta}{rdg}$

$\therefore h \propto \frac{1}{g}$ [If other quantities remains constant]

$\frac{h_{moon}}{h_{earth}} = \frac{g_{earth}}{g_{moon}} = 6 \Rightarrow h_{moon} = 6h$ [As $g_{earth} = 6g_{moon}$]

50. (b)
Sol. Detergent decreases the surface tension so level of water rise will be lesser.

51. (a)

Sol. Those reaction which have more value of K proceeds towards completion.

52. (d)

Sol. $A + B \rightleftharpoons C + D$

$x \quad x \quad 0 \quad 0$

$2x \quad 2x$

$$K_c = \frac{[C][D]}{[A][B]} = \frac{2x.2x}{x.x} = 4$$

53. (d)

Sol. $N_2O_4 \rightleftharpoons 2NO_2$

$\underset{(1-\alpha)}{1} \qquad \underset{2\alpha}{0}$

total mole at equilibrium $= (1-\alpha) + 2\alpha = 1 + \alpha$

54. (b)

Sol. $K = \frac{[C_2H_6]}{[C_2H_4][H_2]} = \frac{[\text{mole/litre}]}{[\text{mole/litre}][\text{mole/litre}]}$

= litre/mole. or litre mole^{-1}.

55. (c)

Sol. $K_c = \frac{[PCl_3][Cl_2]}{[PCl_5]} = \frac{\frac{0.2}{10} \times \frac{0.2}{10}}{[0.1/10]} = 0.04$.

56. (d)

Sol. $NH_4HS \rightleftharpoons NH_{3(g)} + H_2S_{(g)}$

$a \qquad 0.5\,atm$

$a - x \qquad 0.5 + x \qquad x$

Total pressure $= 0.5 + 2x = 0.84$

i.e., $x = 0.17$

$K_p = P_{NH_3}.P_{H_2S} = (0.67).(0.17) = 0.1139$

57. (b)

Sol. $K_c = \frac{K_f}{K_b} \therefore K_b = \frac{K_f}{K_c} = \frac{10^5}{100} = 10^3$

58. (d)

Sol. $K_1 = \frac{[NO_2]}{[NO][O_2]^{1/2}}$; $K_2 = \frac{[NO]^2[O_2]}{[NO_2]^2}$

$\Rightarrow \frac{[NO_2]^2}{[NO]^2[O_2]} = \frac{1}{K_2} \Rightarrow \frac{[NO_2]}{[NO][O_2]^{1/2}} = \frac{1}{\sqrt{K_2}}$

$\Rightarrow K_1 = \frac{1}{\sqrt{K_2}}$; $K_2 = \frac{1}{K_1^2}$.

59. (a)

Sol. For the reaction,

$CaCO_{3(g)} \rightleftharpoons CaO_{(s)} + CO_{2(g)}$

$K_p = P_{CO_2}$ and $K_C = [CO_2]$

($\because$ $[CaCO_3] = 1$ and $[CaO] = 1$ for solids]

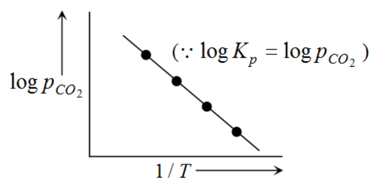
According to Arrhenius equation we have

$K = Ae^{-\Delta H^\circ_r / RT}$

Taking logarithm, we have

$$\log K_p = \log A - \frac{\Delta H_r^o}{RT(2.303)}$$

This is an equation of straight line. When log K_p is plotted against 1 / T. we get a straight line.



The intercept of this line = log A, slope = $-\Delta H^\circ_r / 2.303$ R

Knowing the value of slope from the plot and universal gas constant R, ΔH_r° can be calculated.

(Equation of straight line : Y = mx + C. Here,

$$\log K_p = -\frac{\Delta H_r^o}{2.303\,R}\left(\frac{1}{T}\right) + \log A$$

Y=m x+ C

60. (a)

Sol. Effect of catalyst is that it attains equilibrium quickly by providing a new reaction path of low activation energy. It does not alter the state of equilibrium.

61. (c)

Sol. Both Δn and ΔH are negative. Hence, high pressure and low temperature will forward reaction.

62. (b)

Sol. Active mass

$$= \frac{\frac{\text{weight}}{\text{M.wt.}}}{\text{Volume}} = \frac{\text{weight}}{\text{M.wt.} \times \text{Volume}} = \frac{96}{32 \times 2} = \frac{3}{2} = 1.5\, mol\ /\ litre$$

63. (c)

Sol. $K_p = K_c(RT)^{\Delta n} \Rightarrow 5 \times 10^{-2} = K_c(R \times 1000)^1 \Rightarrow K_c = \frac{5 \times 10^{-5}}{R}$

64. (d)

Sol. The equilibrium constant is unaffected by changing the concentration of products, catalyst and concentration of reactants. It is affected by changing the temperature.

65. (a)

Sol. $\log K_2 / \log K_1 = \frac{-\Delta H}{2.303}\left[\frac{1}{T_2} - \frac{1}{T_1}\right]$

$\Delta H = \text{Positive}$

66. (c)

Sol. Solubility of gas is directly proportional to the pressure of gas above liquid.

67. (d)

Sol. $\Delta G^o = -RT\ln K$

If $\ln K = -ve$ then only $\Delta G^o = +ve\ (\text{or} > 0)$.

Thus, $K < 1$

68. (c)

Sol. Number of moles of reactants and products is always equal.

69. (b)

Sol. $\Delta n_g = n_{g(p)} - n_{g(r)}$

70. (a)

Sol. $2NO_{2(g)} \rightleftharpoons N_2O_{4(g)}$

$\Delta n = 1 - 2 = -1$

$K_P = K_c(RT)^{\Delta n}$

$\frac{K_p}{K_c} = (RT)^{-1}$

71. (b)

Sol. $P_{4(s)} + 5O_{2(g)} \rightleftharpoons P_4O_{10(s)}$

Since concentration of solids is taken as 1, expression for equilibrium constant involves only oxygen.

$K_c = \frac{1}{[O_2]^5}$

72. (c)

Sol. $C_{12}H_{22}O_{11}$ is a sugar and non-electrolyte.

73. (a)

Sol. $K = \frac{\alpha^2 C}{1-\alpha}; \alpha = \frac{0.01}{100} \approx 1 \therefore K = \alpha^2 C = \left[\frac{0.01}{100}\right]^2 \times 1$

$= 1 \times 10^{-8}$.

74. (b)

Sol. Mathematical form of Ostwald's dilution law.

75. (a)

Sol. $FeCl_3 + 3H_2O \rightleftharpoons Fe(OH)_3 + 3HCl$.

Strong acid and weak base.

76. (d)

Sol. $HClO_4$ is a acid and their conjugate base is ClO_4^-.

77. (b)
Sol. The basic character of hydride decreases down the group.
78. (b)
Sol. Its ionization is very less.
79. (c)
Sol. Due to common ion effect.
80. (a)
Sol. $Mg(OH)_2 \rightleftharpoons \underset{(X)}{Mg^{++}} + \underset{(2X)^2}{2OH^-}$

$K_{sp} = 4X^3$
81. (c)
Sol. $BaSO_4 \rightleftharpoons \underset{\substack{(S)\\0.01}}{Ba^{++}} + \underset{\substack{(S)\\5}}{SO_4^{--}}$

$K_{sp} = S^2 = S \times S = 0.01 \times S$

$S_{(SO_4^{2-})} = \frac{K_{sp}}{S_{(Ba^{++})}} = \frac{1\times10^{-9}}{0.01} = 10^{-7}$ mole/litre.
82. (d)
Sol. K_{sp} for $CaF_2 = 4s^3 = 4\times[2\times10^{-4}]^3 = 3.2\times10^{-11}$.
83. (b)
Sol. NH_4Cl is hydrolysed and give $[H^+]$

$NH_4Cl + H.OH \rightleftharpoons NH_4OH + HCl$

$NH_4^+ + H.OH \rightleftharpoons NH_4OH + H^+$
84. (c)
Sol. For the precipitation of an electrolyte, it is necessary that the ionic product must exceed its solubility product.
85. (b)
Sol. NH_4CN is a salt of weak acid and weak base and thus for it.

SECTION-B

86. (d)
Sol. Because CCl_4 is a organic solvent and $AgNO_3$ is insoluble in organic solvent.
87. (a)
Sol. pH of blood does not change because it is a buffer solution.
88. (d)
Sol. $[H_3O^+]$ means $[H^+] = 6.2\times10^{-9}$ mol/l

$pH = -\log(6.2\times10^{-9}) = 8.21$.

89. (b)

Sol. $CH_3NH_2 + HCl \longrightarrow CH_3NH_3^+Cl^-$

0.1	0.08	0
0.02	0	0.08

(Basic buffer solution)

$pOH = pK_b + \log \frac{0.08}{0.02}$

$= pK_b + 0.602$

$= 3.30 + 0.602 = 3.902$

$\therefore$ pH = 10.09

$[H^+] = 7.99 \times 10^{-11} \approx 8 \times 10^{-11}$ M

90. (a)

Sol. Buffer solution is a mixture of weak acid and its conjugate base.

91. (b)

Sol. Adding Na_2CO_3 to water makes the solution basic and hence a pH increases from 7.

92. (d)

Sol. As the solution is acidic, $pH < 7$. This is because $[H^+]$ from $H_2O[10^{-7}M]$ cannot be neglected in comparison to 10^{-10} M

93. (a)

Sol. For forward reaction $[Al(H_2O)_6]^{+3}$ is acid and for backward reaction H_2CO_3 is an acid.

94. (c)

Sol. It is the salt of weak acid and weak base, hence its degree of hydrolysis will be independent of concentration

$h = \sqrt{\frac{K_w}{K_a \times K_b}}$.

95. (a)

Sol. When rain is accompanied by a thunderstorm,

$N_2 + O_2 \quad NO \longrightarrow NO_2 \xrightarrow{H_2O} HNO_2 + HNO_3$

96. (b)

Sol.

$HSO_4^- \longrightarrow H_2SO_4$

$\downarrow$

SO_4^{2-}

HSO_4^- can accept or give a proton.

97. (c)

Sol. $K_2CO_3 + 2H_2O \rightleftharpoons \underset{\text{Weak acid}}{H_2CO_3} + \underset{\text{Strong base}}{2KOH}$

$KOH \rightleftharpoons K^+ + OH^-$ (Basic solution),

98. (b)

Sol. $H_2SO_4 \rightleftharpoons 2H^+ + SO_4^{2-}$

$[H^+] = 2\times1\times10^{-4}\,M$

$pH = -\log\left(2\times10^{-4}\right) = 3.70$

99. (d)

Sol. Lewis acid is acceptor of a pair of electrons while lewis base is donor of a pair of electons.

100. (b)

Sol. $NH_4COONH_{2(s)} \rightleftharpoons 2NH_{3(g)} + CO_{2(g)}$

2p p

When volume and temperature are constant, the number of moles of a gas is proportional to its partial pressure.

So, 2p + p = 3

3p = 3, $\therefore$ p = 1 atm

$K_p = (2p)^2 \times p = 4p^3 = 4\times(1)^3 = 4\,atm^3$

BOTANY									
Q.	**ANS.**	**Q.**	**ANS.**	**Q.**	**ANS.**	**Q.**	**ANS.**	**Q.**	**ANS.**
101	**C**	**113**	**B**	**125**	**C**	**136**	**A**	**148**	**C**
102	**D**	**114**	**C**	**126**	**D**	**137**	**B**	**149**	**B**
103	**C**	**115**	**D**	**127**	**C**	**138**	**A**	**150**	**D**
104	**A**	**116**	**B**	**128**	**C**	**139**	**C**		
105	**A**	**117**	**A**	**129**	**C**	**140**	**B**		
106	**B**	**118**	**D**	**130**	**A**	**141**	**B**		
107	**D**	**119**	**A**	**131**	**B**	**142**	**A**		
108	**A**	**120**	**C**	**132**	**C**	**143**	**A**		
109	**D**	**121**	**C**	**133**	**D**	**144**	**B**		
110	**D**	**122**	**B**	**134**	**B**	**145**	**C**		
111	**A**	**123**	**C**	**135**	**D**	**146**	**D**		
112	**C**	**124**	**A**			**147**	**D**		

ZOOLOGY									
Q.	**ANS.**	**Q.**	**ANS.**	**Q.**	**ANS**	**Q.**	**ANS.**	**Q.**	**ANS**
151	**B**	**163**	**B**	**175**	**A**	**186**	**A**	**198**	**D**
152	**B**	**164**	**B**	**176**	**B**	**187**	**B**	**199**	**A**
153	**C**	**165**	**D**	**177**	**C**	**188**	**C**	**200**	**C**
154	**B**	**166**	**A**	**178**	**B**	**189**	**D**		
155	**A**	**167**	**C**	**179**	**A**	**190**	**A**		
156	**D**	**168**	**A**	**180**	**C**	**191**	**A**		
157	**C**	**169**	**B**	**181**	**C**	**192**	**B**		
158	**C**	**170**	**D**	**182**	**B**	**193**	**C**		
159	**B**	**171**	**A**	**183**	**D**	**194**	**A**		
160	**B**	**172**	**C**	**184**	**B**	**195**	**C**		
161	**C**	**173**	**B**	**185**	**B**	**196**	**D**		
162	**C**	**174**	**A**			**197**	**B**		