PHYSICS

31. A soap film of surface tension $3\times10^{-2}\ Nm^{-1}$ formed in rectangular frame, can support a straw. The length of the film is 10 cm. Mass of the straw the film can support is

1) 0.06 gm **2)** 0.6 gm **3)** 6 gm **4)** 60 gm

32. If the work done in blowing a bubble of volume V is W, then the work done in blowing the bubble of volume 2V from the same soap solution will be

1) W/2 **2)** $\sqrt{2}$ W **3)** $\sqrt[3]{2}$ W **4)** $\sqrt[3]{4}$ W

33. Excess pressure inside a soap bubble is three times that of the other bubble, then the ratio of their volumes will be

1) 1 : 3 **2)** 1 : 9 **3)** 1 : 27 **4)** 1 : 81

34. The angle of contact between glass and water is 0^0 and it rises in a capillary upto 6 cm when its surface tension is 70 dynes/cm. Another liquid of surface tension 140 dynes/cm, angle of contact 60^0 and relative density 2 will rise in the same capillary by

1) 12 cm **2)** 24 cm **3)** 3 cm **4)** 6 cm

35. A soap bubble of radius R is blown. After heating the solution a second bubble of radius 2R is blown. The work required to blow the second bubble in comparison to that required for the first bubble is

1) Double **2)** Slightly less than double

3) Slightly less than four times **4)** Slightly more than four times

36. The diameter of rain-drop is 0.02 cm. If surface tension of water be 72×10^{-3} *newton* per metre, then the pressure difference of external and internal surfaces of the drop will be

1) $1.44\times10^4\ dyne-cm^{-2}$ **2)** $1.44\times10^4\ newton-m^{-2}$

3) $1.44\times10^3\ dyne-cm^{-2}$ **4)** $1.44\times10^5\ newton-m^{-2}$

37. Work done in splitting a drop of water of 1 mm radius into 106 droplets is (Surface tension of water $=72\times10^{-3}J/m^2$)

1) $9.58\times10^{-5}J$ **2)** $8.95\times10^{-5}J$ **3)** $5.89\times10^{-5}J$ **4)** $5.98\times10^{-6}J$

38. One thousand small water drops of equal radii combine to form a big drop. The ratio of final surface energy to the total initial surface energy is

1) 1000 : 1 **2)** 1 : 1000 **3)** 10 : 1 **4)** 1 : 10

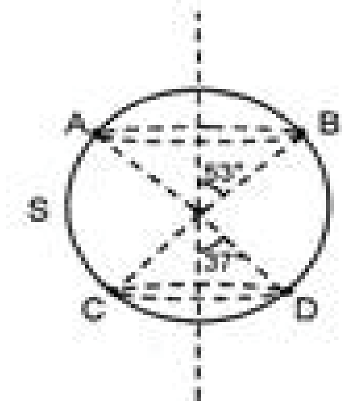
39. The work done in increasing the size of a soap film from 10 cm× 6 cm to 10cm×11cm is 3 ×10^{-4} joule. The surface tension of the film is

1) $1.5\times10^{-2}N/m$ **2)** $3.0\times10^{-2}N/m$ **3)** $6.0\times10^{-2}N/m$ **4)** $11.0\times10^{-2}N/m$

40. Pressure inside two soap bubbles are 1.01 and 1.02 atmospheres. Ratio between their volumes is

1) 102 : 101 **2)** 101 : 102 **3)** 8 : 1 **4)** 2 : 1

41. We have a spherical soap bubble of radius R, made up by liquid having surface tension S. AB and CD are two parallel planes as shown in figure. Net force of surface tension on part ABCD due to rest of the part is



1) $\frac{28\pi RS}{25}$ **2)** $\frac{14\pi RS}{15}$ **3)** $\frac{14\pi RS}{9}$ **4)** $\frac{7\pi RS}{5}$

42. The volume of an air bubble becomes three times as it rises from the bottom of a lake to its surface. Assuming atmospheric pressure to be 75 cm of Hg and the density of water to be 1/10 of the density of mercury, the depth of the lake is

1) 5 m **2)** 10 m **3)** 15 m **4)** 20 m

43. The pressure inside a small air bubble of radius 0.1 mm situated just below the surface of water will be equal to [Take surface tension of water $70\times10^{-3}Nm^{-1}$ and atmospheric pressure = $1.013\times10^{5}Nm^{-2}$]

1) $2.054\times10^{3}Pa$ **2)** $1.027\times10^{3}Pa$ **3)** $1.027\times10^{5}Pa$ **4)** $2.054\times10^{5}Pa$

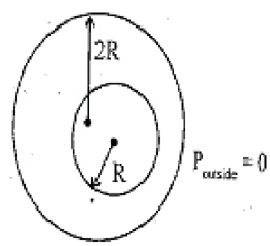
44. There is a horizontal film of soap solution. On it a thread is placed in the form of a loop. The film is pierced inside the loop and the thread becomes a circular loop of radius R. If the surface tension of the loop be T, then what will be the tension in the thread

1) $\pi R^2 / T$ **2)** $\pi R^2 T$ **3)** $2\pi RT$ **4)** $2RT$

45. A large number of water drops each of radius r combine to have a drop of radius R. If the surface tension is T and the mechanical equivalent of heat is J, then the rise in temperature will be

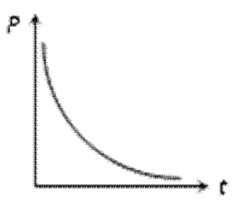
1) $\frac{2T}{rJ}$ **2)** $\frac{3T}{RJ}$ **3)** $\frac{3T}{J}\left(\frac{1}{r}-\frac{1}{R}\right)$ **4)** $\frac{2T}{J}\left(\frac{1}{r}-\frac{1}{R}\right)$

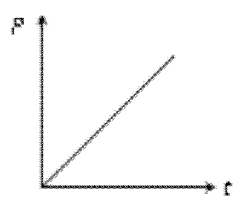
46. There is a soap bubble in which there exists yet another soap bubble. It is given that the outside pressure is zero. If due to some reason the inner bubble bursts then the radius of bigger bubble will

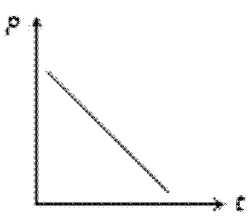


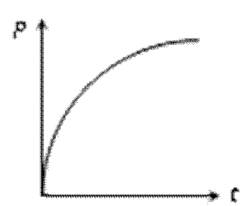
1) Remain 2R **2)** Become 3R **3)** Become $\sqrt{5}R$ **4)** Become 4R

47. A soap bubble is blown with the help of a mechanical pump at the mouth of a tube. The pump produces a certain increase per minute in the volume of the bubble, irrespective of its internal pressure. The graph between the pressure inside the soap bubble and time t will be-

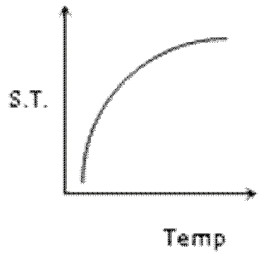
1) 

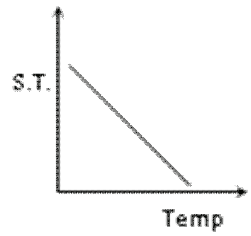
2) 

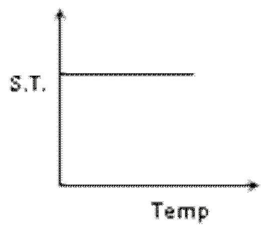
3) 

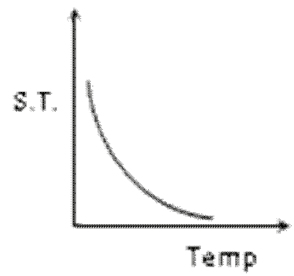
4) 

48. Which graph represents the variation of surface tension with temperature over small temperature ranges for water

1) 

2) 

3) 

4) 

49 Two soap bubbles coalesce to form a single bubble. If V is the subsequent change in volume of contained air and S change in total surface area, T is the surface tension and P atmospheric pressure, then which of the following relation is correct? (Temperature is constant)

1) $4PV+3ST=0$ **2)** $3PV+4ST=0$

3) $2PV+3ST=0$ **4)** $3PV+2ST=0$

50. A container, whose bottom has round holes with diameter 0.1 mm is filled with water. The maximum height in cm upto which water can be filled without leakage will be (Surface tension of water = $75\times10^{-3}N/\text{m}$ and $g=10m/s^2$)

1) 20 cm **2)** 40 cm **3)** 30 cm **4)** 60 cm

51. If two soap bubbles of different radii are connected by a tube:

1) Air flows from the bigger bubble to the smaller bubble till the sizes become equal

2) Air flows from bigger bubble to the smaller bubble till the sizes are interchanged

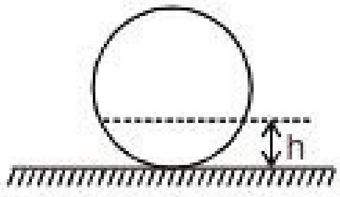
3) Air flows from the smaller bubble to the bigger

4) There is no flow of air

52. Two soap bubbles with radii r and $(r_1>r_2)$ come in contact. Their common surface has radius of curvature r.

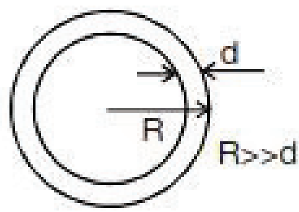
1) $r=\frac{r_1+r_2}{2}$ **2)** $r=\frac{r_1r_2}{r_1-r_2}$ **3)** $r=\frac{r_1r_2}{r_1+r_2}$ **4)** $r=\sqrt{r_1r_2}$

53. A liquid is filled in a spherical container of radius R till a height h. At this positions the liquid surface at the edges is also horizontal. The contact angle is



1) 0 **2)** $\cos^{-1}\left(\frac{R-h}{R}\right)$ **3)** $\cos^{-1}\left(\frac{h-R}{R}\right)$ **4)** $\sin^{-1}\left(\frac{R-h}{R}\right)$

54. A soap bubble has radius R and thickness (d<< R) as shown. It collapses into a spherical drop. The ratio of excess pressure in the drop to the excess pressure inside the bubble is.



1) $\left(\frac{R}{3d}\right)^{\frac{1}{3}}$ **2)** $\left(\frac{R}{6d}\right)^{\frac{1}{3}}$ **3)** $\left(\frac{R}{24d}\right)^{\frac{1}{3}}$ **4)** None

55. A film of water is formed between two straight parallel wires each 10cm long and at separation 0.5 cm. The work done to increase 1 mm distance between wires is (Surface tension of water = $72\times10^{-3}Nm^{-1}$)

1) $1.44\times10^{-8}J$ **2)** $1.44\times10^{-5}J$ **3)** $1.44\times10^{-6}J$ **4)** $2.44\times10^{-5}J$

56 A large number of droplets, each of radius a, coalesce to form a bigger drop of radius b. Assume that the energy released in the process is converted into the kinetic energy of the drop. The velocity of the drop is ($\sigma=$surface tension, $\rho=$density)

1) $[\frac{\sigma}{\rho}(\frac{1}{a}-\frac{1}{b})]^{1/2}$ **2)** $[\frac{2\sigma}{\rho}(\frac{1}{a}-\frac{1}{b})]^{1/2}$ **3)** $[\frac{3\sigma}{\rho}(\frac{1}{a}-\frac{1}{b})]^{1/2}$ **4)** $[\frac{6\sigma}{\rho}(\frac{1}{a}-\frac{1}{b})]^{1/2}$

57. A ring cut from a platinum tube, 8.5 cm internal diameter and 8.7 cm external diameter, is supported horizontally from the pair of a balance so that it comes in contact with the water in a vessel. If an extra weight of 3.97 g is required to pull it away from water, then the surface tension of water is

1) 7.2×10^{-2} N/ m **2)** 72×10^{-2} N/ m **3)** $6.2\times10^{-2}m$ **4)** $62\times10^{-2}m$

58. There is a soap bubble of radius $2.4\times10^{-4}m$ in air cylinder which is originally at the pressure of 10^5 Nm^{-2}. The air in the cylinder is now compressed isothermally until the radius of the bubble is halved. Then the pressure of air in the cylinder is (The surface tension of the soap solution is 0.08 Nm$^{-1)}$

1) $8.08\times10^7 n/m^2$ **2)** $8\times10^3 n/m^2$ **3)** $9.5\times10^5 N/m^2$ **4)** $8.08\times10^5 N/m^2$

59. Two soap bubbles of radii a and b combine to form a single bubble of radius c. If the external pressure is P, then the surface tension of soap solution is

1) $\dfrac{4\left(c^3-a^3-b^3\right)}{p\left(a^2+b^2-c^2\right)}$ **2)** $\dfrac{p\left(c^3-a^3-b^3\right)}{4\left(a^2+b^2-c^2\right)}$

3) $\dfrac{p\left(a^2+b^2-c^2\right)}{4\left(c^3-a^3-b^3\right)}$ **4)** $\dfrac{4\left(a^2+b^2-c^2\right)}{p\left(c^3-a^3-b^3\right)}$

60. A large number of liquid drops each of radius r coalesce to from a single drop of radius R . The energy released in the process is converted into kinetic energy of the big drop so formed . The speed of the big drop is (given , surface tension of liquid T , density ρ)

1) $\sqrt{\frac{T}{\rho}(\frac{1}{r}-\frac{1}{R})}$ **2)** $\sqrt{\frac{2T}{\rho}(\frac{1}{r}-\frac{1}{R})}$ **3)** $\sqrt{\frac{4T}{\rho}(\frac{1}{r}-\frac{1}{R})}$ **4)** $\sqrt{\frac{6T}{\rho}(\frac{1}{r}-\frac{1}{R})}$

Sri Chaitanya IIT Academy., India.

A.P, TELANGANA, KARNATAKA, TAMILNADU, MAHARASHTRA, DELHI, RANCHI

A right Choice for the Real Aspirant

ICON Central Office – Madhapur – Hyderabad

Sec: Sri Chaitanya-Jr.Chaina | **Jee-Main** | **Date: 08-12-18**

Time: 3 Hr's | **WTM -19** | **Max.Marks:360**

Key Sheet

MATHEMATICS

1) 3	2) 3	3) 3	4) 4	5) 1	6) 3	7) 3	8) 4	9) 2	10) 2
11) 2	12) 2	13) 2	14) 1	15) 3	16) 1	17) 3	18) 1	19) 2	20) 1
21) 1	22) 4	23) 1	24) 1	25) 1	26) 1	27) 4	28) 3	29) 1	30) 2

PHYSICS

31) 2	32) 4	33) 3	34) 3	35) 3	36) 1	37) 2	38) 4	39) 2	40) 3
41) 1	42) 3	43) 3	44) 4	45) 3	46) 3	47) 1	48) 2	49) 2	50) 3
51) 3	52) 2	53) 2	54) 3	55) 2	56) 4	57) 1	58) 4	59) 2	60) 4

CHEMISTRY

61) 4	62) 1	63) 4	64) 4	65) 3	66) 4	67) 2	68) 3	69) 4	70) 4
71) 1	72) 3	73) 1	74) 1	75) 4	76) 3	77) 3	78) 4	79) 3	80) 1
81) 2	82) 4	83) 2	84) 2	85) 4	86) 2	87) 4	88) 4	89) 2	90) 3

Now $\sum_{r=1}^{n} t_r = \left(\frac{1}{2!}-\frac{1}{3!}\right)+\left(\frac{1}{3!}-\frac{1}{4!}\right)+\left(\frac{1}{4!}-\frac{1}{5!}\right)+...+\left(\frac{1}{(n+1)!}-\frac{1}{(n+2)!}\right)$

$\Rightarrow \sum_{r=1}^{n} t_r = \frac{1}{2!}-\frac{1}{(n+2)!}$. Hence, $a = \underset{n\to\infty}{Lt}\left\{\frac{1}{2}-\frac{1}{(n+2)!}\right\}=\frac{1}{2}$.

Now, $b = \underset{x\to 0}{Lt}\frac{e^{\sin x}-e^{x}}{\sin x - x} \Rightarrow b = \underset{x\to 0}{Lt}\, e^{x}.\left(\frac{e^{\sin x - x}-1}{\sin x - x}\right) = e^{0}.1 = 1.$

$\therefore b = 2a.$

29. $\underset{n\to\infty}{Lt}\, a_{n+1} = \underset{n\to\infty}{Lt}\frac{4+3a_n}{3+2a_n} \Rightarrow a = \frac{4+3a}{3+2a} \Rightarrow 2a^2 = 4 \Rightarrow a = \sqrt{2}\left[a_n > 0 \Rightarrow a \geq 0\right]$

30. $P = \lim_{n\to\infty} n^2\left\{\sqrt{\left(1-\cos\frac{1}{n}\right)\sqrt{\left(1-\cos\frac{1}{n}\right)\sqrt{\left(1-\cos\frac{1}{n}\right)....\infty}}}\right\}$

Put $\frac{1}{n} = x \therefore P = \lim_{x\to 0}\frac{\sqrt{(1-\cos x)\sqrt{(1-\cos x)\sqrt{(1-\cos x).....\infty}}}}{x^2}$

$= \lim_{x\to 0}\frac{(1-\cos x)^{\frac{1}{2}+\frac{1}{2^2}+\frac{1}{2^3}+....\infty}}{x^2} = \lim_{x\to 0}\frac{(1-\cos x)}{x^2}.\frac{(1+\cos x)}{(1+\cos x)}$

$= \lim_{x\to 0}\left(\frac{\sin x}{x}\right)^2.\lim_{x\to 0}\frac{1}{(1+\cos x)} = (1)^2.\frac{1}{1+1} = \frac{1}{2}$

PHYSICS

31. The weight of straw will be balanced by the force of

surface tension $\therefore\ mg = 2Tl \Rightarrow m = \frac{2Tl}{g} = \frac{2\times 3\times 10^{-2}\times 10\times 10^{-2}}{9.8} kg = 0.6gm$

32. Work done to form a soap bubble

$W = 8\pi R^2 T$ (As $V \propto R^3 \therefore\ R \propto V^{1/3}$)$\therefore\ W \propto V^{2/3}$

$\frac{W_2}{W_1} = \left(\frac{V_2}{V_1}\right)^{2/3} = (2)^{2/3} \Rightarrow W_2 = (4)^{1/3} W$

33. $\Delta P \propto \frac{1}{r} \Rightarrow \frac{\Delta P_1}{\Delta P_2} = \frac{r_2}{r_1} \Rightarrow \frac{r_2}{r_1} = \frac{3}{1}$ $\therefore\ \frac{V_1}{V_2} = \left(\frac{r_1}{r_2}\right)^3 = \left(\frac{1}{3}\right)^3 = \frac{1}{27}$

34. $h = \frac{2T\cos\theta}{rdg}\ \therefore\ \frac{h_2}{h_1} = \frac{T_2}{T_1}\times\frac{\cos\theta_2}{\cos\theta_1}\times\frac{d_1}{d_2}\times\frac{r_1}{r_2}$

$\frac{h_2}{h_1} = \frac{140}{70}\times\frac{\cos 60^\circ}{\cos 0^\circ}\times\frac{1}{2}\times 1 = \frac{1}{2} \Rightarrow h_2 = \frac{h_1}{2} = 3cm.$

35. Work done to form a bubble of radius R

$W_1 = 8\pi R^2 T_1$

Work done to form a bubble of radius $2R$ $W_2 = 8\pi(2R)^2 T_2 = 32\pi R^2 T_2\ \therefore\ \frac{W_1}{W_2} = \frac{T_1}{4T_2}$

If surface tension of soap solution is same then $W_2 = 4W_1$

But in the problem temperature of solution is increased so its surface tension decreases.

$\therefore\ W_2 < 4W_1$

36. $\Delta P = \frac{2T}{r} = \frac{2\times 72\times 10^{-3}}{0.01\times 10^{-2}} = 1440\ N/m^2 = 1.44\times 10^4\ dyne/cm^2$

37. Work done in splitting a water drop of radius R into n drops of equal size $= 4\pi R^2 T(n^{1/3}-1)$

$= 4\pi\times(10^{-3})^2\times 72\times 10^{-3}\times(106^{1/3}-1)$

$= 4\pi\times 10^{-6}\times 72\times 10^{-3}\times 99 = 8.95\times 10^{-5} J$

38. As volume remain constant therefore $R = n^{1/3} r$

$\frac{\text{surface energy of one big drop}}{\text{surface energy of } n \text{ drop}} = \frac{4\pi R^2 T}{n\times 4\pi r^2 T}\ \frac{R^2}{nr^2} = \frac{n^{2/3}r^2}{nr^2} = \frac{1}{n^{1/3}} = \frac{1}{(1000)^{1/3}} = \frac{1}{10}$

39. $W = T\times\Delta A\ \therefore\ T = \frac{W}{\Delta A}\quad T = \frac{3\times 10^{-4}}{2\times(110-60)\times 10^{-4}}$ (Soap film has two surfaces)$=3\times 10^{-2} N/m$

40. Outside pressure = 1 atm

Pressure inside first bubble = 1.01 atm

Pressure inside second bubble = 1.02 atm

Excess pressure $\Delta P_1 = 1.01 - 1 = 0.01$ atm

Excess pressure $\Delta P_2 = 1.02 - 1 = 0.02$ atm

$\Delta P \propto \frac{1}{r} \Rightarrow r \propto \frac{1}{\Delta P} \Rightarrow \frac{r_1}{r_2} = \frac{\Delta P_2}{\Delta P_1} = \frac{0.02}{0.01} = \frac{2}{1}$ Since $V = \frac{4}{3}\pi r^3\ \therefore\ \frac{V_1}{V_2} = \left(\frac{r_1}{r_2}\right)^3 = \left(\frac{2}{1}\right)^3 = \frac{8}{1}$

41. Conceptual.

42. $P_1V_1 = P_2V_2 \Rightarrow (H_{Hg}\rho_{Hg} + H_W\rho_W)V = H_{Hg}\rho_{Hg}\times 3V$

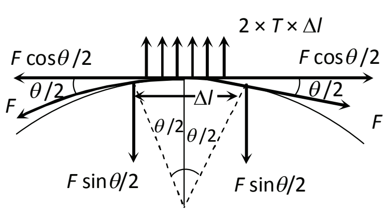
$\Rightarrow H_{Hg}\rho_{Hg} + H_W\frac{\rho_{Hg}}{10} = 3H_{Hg}\rho_{Hg} \Rightarrow H_W = 2H_{Hg}\times 10 = \frac{2\times 75\times 10}{100} = 15m$

43. Excess pressure inside the air bubble $= \frac{2T}{r}$

$\Rightarrow P_{in} - P_{out} = \frac{2T}{r} = \frac{2\times 70\times 10^{-3}}{0.1\times 10^{-3}} = 1400Pa$

$\Rightarrow P_{in} = 1400 + 1.013\times 10^5 = 0.014\times 10^5 + 1.013\times 10^5 = 1.027\times 10^5 Pa$

44. Suppose tension in thread is F, then for small part Δl of thread



$\Delta l = R\theta$ and $2F\sin\theta/2 = 2T\Delta l = 2TR\theta \Rightarrow F = \frac{TR\theta}{\sin\theta/2} = \frac{TR\theta}{\theta/2} = 2TR(\sin\theta/2 \approx \theta/2)$

45. Rise in temperature, $\Delta\theta = \frac{3T}{JSd}\left(\frac{1}{r}-\frac{1}{R}\right)\quad \therefore \Delta\theta = \frac{3T}{J}\left(\frac{1}{r}-\frac{1}{R}\right)$ (For water $S = 1$ and $d = 1$)

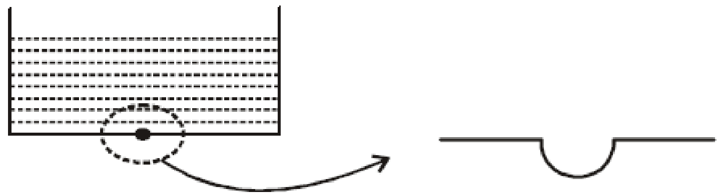
46. Conceptual

47. $\Delta P = \frac{4T}{r}\ \therefore\ \Delta P \propto \frac{1}{r}$ As radius of soap bubble increases with time $\therefore \Delta P \propto \frac{1}{t}$

48. $T_c = T_o(1-\alpha t)$ *i.e.* surface tension decreases with increase in temperature.

49. Conceptual

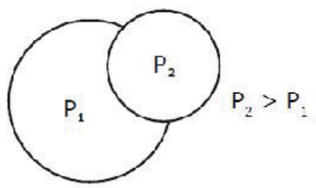
50.



$h\rho g = \frac{2T\times 2}{0.1}$ $\quad h\times 1000\times 10 = \frac{2\times 75\times 10^{-3}\times 2}{0.1\times 10^{-3}}$ $\quad h = \frac{300}{1000} - 0.3m = 30cm$

51. $P = \frac{2T}{r}$ r is small pressure is high $\therefore$ air from higher pressure to lower pressure

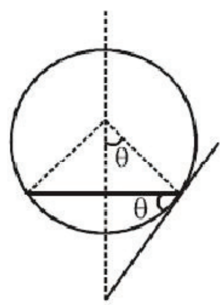
52. $P_1 = P_0 + \frac{4T}{r_1}$



$P_2 = P_0 + \frac{4T}{r_2}$ $\quad r_2 < r_1$ $\quad P_2 - P_1 = P_{excess} = \frac{4T}{R}$

$4T\left[\frac{1}{r_2} - \frac{1}{r_1}\right] = \frac{4T}{R}$ $\quad R = \frac{r_2 r_1}{r_1 - r_2}$

53.



$\cos\theta = \frac{R-h}{R}$ $\quad \theta = \cos^{-1}\left(\frac{R-h}{R}\right)$

54. $P_{exi} = \frac{4T}{R}$ $\quad 4\pi R^2 d = \frac{4}{3}\pi r^3$

$\left(3R^2 d\right)^{1/3} = r$ $\quad P_{ef} = \frac{2T}{r}$ $\therefore$ Ratio $= \frac{R}{2r} = \left(\frac{R}{24d}\right)^{1/3}$

55. Initial surface Area $= 2[1\times b] = 2[10\times 0.5] = 10cm^2$

Final surface area $= 2[10\times(0.5+0.1)] = 12cm^2$

Increase in surface Area = 12-10 $= 2\times 10^{-4} m^2$

W.D.=Surface Tension $\times$Increase in surface area

W.D= $72\times 10^{-3}\times 2\times 10^{-4}$ $=1.44\times 10^{-5} Joule$

W.D.= $1.44\times 10^{-5} Joule$

56. Conceptual

57. $(Force)_{S.T.} = S.T.\times$ Total length

$F = \sigma\times(2\pi r + 2\pi R) = 2\pi\sigma(r+R)$

$\sigma = \dfrac{F}{2\pi(r+R)}$ F=3.97 gwt=3.97 $\times 10^{-3} \times 9.8\,N$

$r = 4.5\times10^{-2}\,m, R = 4.35\times10^{-2}\,m$ Putting values $\sigma = 7.2\times10^{-2}\,Nm^{-1}$

58. Initial pressure of air in the cylinder

$P_0 = 10^5\,Nm^{-2}$ $\quad P_m$ Inside bubble= $P_1 = P_0 + \dfrac{4\sigma}{r}$

P_{final} inside bubble = $P_2 = P + \dfrac{4\sigma}{r/2}$ $\quad V_{initial} = v_1 = \dfrac{4}{3}\pi r^3$

$V_{final} = v_2 = \dfrac{4}{3}\pi\left(\dfrac{r}{2}\right)^3 = \dfrac{1}{8}v_1$ $\quad$ By Boyle's law

$P_1V_1 = P_2V_2$ $\quad \left(P_0 + \dfrac{4\sigma}{r}\right)v_1 = \left(P + \dfrac{8\sigma}{r}\right)\dfrac{v_1}{8}$

$P = 8P_0 + \dfrac{24\sigma}{r} = 8\times10^5 + \dfrac{24\times0.08}{2.4\times10^{-4}}$ $\quad P = 8.08\times10^5\,Nm^{-2}$

59. For bubble of radius a (σ is surface tension)

$P_a - P = \dfrac{4\sigma}{a}$ or $P_a = P + \dfrac{4\sigma}{a}$ $\quad P_b = \left(P + \dfrac{4\sigma}{b}\right)$

$P_c = \left(P + \dfrac{4\sigma}{c}\right)$ $\quad$ As two bubbles combine

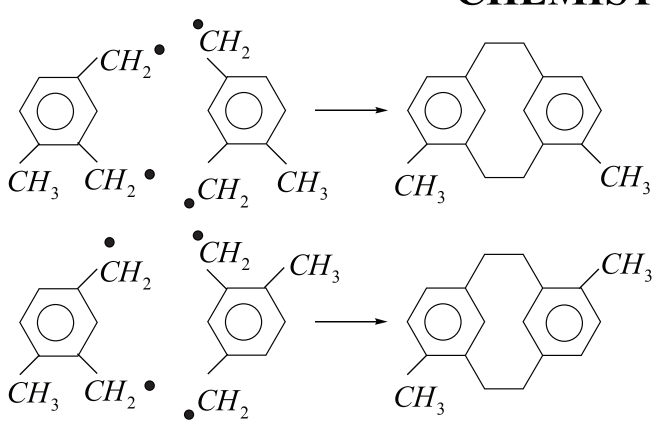
$P_aV_a + P_bV_b = P_cV_c$ $\quad \left(P + \dfrac{4\sigma}{a}\right)\times\dfrac{4}{3}\pi a^3 + \left(P + \dfrac{4\sigma}{b}\right)\times\dfrac{4}{3}\pi b^3 = \left(P + \dfrac{4\sigma}{c}\right)\times\dfrac{4}{3}\pi c^3$

$$\sigma = \frac{P\left(c^3 - a^3 - b^3\right)}{4\left(a^2 + b^2 - c^2\right)}$$

60. Conceptual

CHEMISTRY

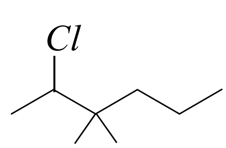
61.



62.

$$CH_3-CH_2-\underset{\underset{CH_3}{|}}{\overset{\overset{CH_3}{|}}{C}}-CH_2-CH_2-CH_3 \xrightarrow{Cl_2/hv}$$

(1) $Cl-CH_2-CH_2-\underset{\underset{CH_3}{|}}{\overset{\overset{CH_3}{|}}{C}}-CH_2-CH_2-CH_3$ (2)



Final Key

S.NO	SUB	Q.NO	GIVEN KEY	FINAL KEY	REMARKS
5	PHY	34	3	Delete	capillarity
6	PHY	37	2	Delete	they hae given 106 is tead of 106