SURFACE TENSION

1. Mercury does not wet glass, wood or iron because

(a) Cohesive force is less than adhesive force (b) Cohesive force is greater than adhesive force

(c) Angle of contact is less than 90^o (d) Cohesive force is equal to adhesive force

2. The spherical shape of rain-drop is due to

(a) Density of the liquid (b) Surface tension (c) Atmospheric pressure (d) Gravity

3. At which of the following temperatures, the value of surface tension of water is minimum

(a) 4^oC (b) 25^oC (c) 50^oC (d) 75^oC

4. The main difference between a stretched membrane and the liquid surface is

(a) The liquid surface has a tendency to contract but the stretched membrane does not

(b) The surface tension does not depend on area but on the tension of the stretched membrane does

(c) The surface tension increases with increases in area

(d) Surface tension increases irregularly with temperature

5. On bisecting a soap bubble along a diameter, the force due to surface tension on any of its half part will be

(a) $4\pi RT$ (b) $\frac{4\pi R}{T}$ (c) $\frac{T}{4\pi R}$ (d) $\frac{2T}{R}$

6. 1000 drops of water all of same size join together to form a single drop and the energy released raises the temperature of the drop. Given that T is the surface tension of water, r the radius of each small drop, ρ the density of liquid, J the mechanical equivalent of heat. What is the rise in the temperature

(a) T/Jr (b) $10T/Jr$ (c) $100T/Jr$ (d) None of these

7. Two bubbles A and B ($A > B$) are joined through a narrow tube. Then

(a) The size of A will increase (b) The size of B will increase

(c) The size of B will increase until the pressure equals (d) None of these

8. Excess pressure of one soap bubble is four times more than the other. Then the ratio of volume of first bubble to another one is

(a) 1 : 64 (b) 1 : 4 (c) 64 : 1 (d) 1 : 2

9. The angle of contact between glass and mercury is

(a) 0^o (b) 30^o (c) 90^o (d) 135^o

10. When the temperature is increased the angle of contact of a liquid

(a) Increases (b) Decreases

(c) Remains the same (d) First increases and then decreases

11. Water rises to a height of 10cm in capillary tube and mercury falls to a depth of 3.112cm in the same capillary tube. If the density of mercury is 13.6 and the angle of contact for mercury is 135^o, the ratio of surface tension of water and mercury is

(a) 1 : 0.15 (b) 1 : 3 (c) 1 : 6 (d) 1.5 : 1

12. Water can rise to a height h in a capillary tube lowered vertically into water. If the height of tube above the surface of water be l and $l < h$, then water will rise in the capillary to a height

(a) h (b) l (c) $l - h$ (d) $l + h$

13. Water rises in a capillary tube through a height h. If the tube is inclined to the liquid surface at 30^o, the liquid will rise in the tube upto its length equal to

(a) $\frac{h}{2}$ (b) h (c) $2h$ (d) $4h$

14. In the above question, the radius of the bigger drop will be

(a) $\sqrt{3}$ cm (b) $\sqrt{5}$ cm (c) $\sqrt{7}$ cm (d) $\sqrt{8}$ cm

15. The surface tension for pure water in a capillary tube experiment is

(a) $\frac{\rho g}{2hr}$ (b) $\frac{2}{hr\rho g}$ (c) $\frac{r\rho g}{2h}$ (d) $\frac{hr\rho g}{2}$