St. Lawrence High School

A Jesuit Christian Minority Institution

Term : 2nd

Work Sheet – 31

Class – XI Subject – Physics Date – 14.11.20

Chapter – Bulk Properties of Matter Topic – Surface Tension

Choose the correct option for the following questions. $1 \times 15 = 15$

1. A water drop has excess pressure P. It is divided into 8 equal droplets. The excess pressure in the small droplets will be
   a. Same as P b. less than P c. More than P d. 8times

2. If two isolated soap bubbles of radii 1cm and 2cm are connected by a narrow pipe gently, then air will flow
   a. From bigger to smaller b. Smaller to bigger
   c. First from bigger to smaller and then from smaller to bigger d. air will not flow

3. A paper disc of radius R from which a hole of radius r is cut out is floating in a liquid of surface tension S. The force on the disc due to surface tension is
   a. $2\pi RS$ b. $2\pi rS$ c. $2\pi(R-r)S$ d. $2\pi(R+r)S$

4. If T be the surface tension of soap solution, then the amount of work done in blowing a soap bubble from diameter D to 2D is
   a. $2\pi D^2T$ b. $4\pi D^2T$ c. $6\pi D^2T$ d. $8\pi D^2T$

5. The surface energy of a liquid drop is E. It is sprayed into 100 equal droplets. Then its surface energy becomes
   a. 1000E
   b. 100E
   c. 10E
   d. E

6. In the previous question, the work done in spraying is
   a. 999E b. 99E c. 9E d. E

7. Two soap bubbles, one of radius 50mm and the other of radius 80mm, are brought in contact so that they have common interface. The radius of the curvature of the common interface is
   a. 0.003m b. 0.133m c. 1.2m d. 8.9m

8. The lower end of a capillary tube is at a depth of 12cm and water rises 3cm in it. The mouth pressure required to blow an air bubble at the lower end will be x cm of water column, where x is
   a. 12cm b. 15cm C. 3cm d. 9 cm

9. If the radius of the capillary tube is increased, then the capillary rise inside the tube will
   a. increase b. decrease c. remain same d. be double

10. Two capillary tubes of radii $2 \times 10^{-3} m$ and 4×10^{-3}m are dipped into same liquid. The ratio of heights through which the liquid will rise in the tubes is

a. 1:2 b. 2:1 c. 1:4 d.4:1

11. The work done in blowing a soap bubble of 0.10m radius is (surface tension of soap solution is 0.03 N /m) is

a. 37.68×10^{-4} J b. 75.36×10^{-4} J c. 126.82×10^{-4} J d. 75.36×10^{-3} J

12. Suppose W is the work done when a bubble of volume V is formed from a soap solution. How much work is required to be done to form a bubble of volume 2V?

a. W b. $4^{\frac{1}{3}} W$ c. 2W d. $2^{\frac{1}{3}} W$

13. A liquid will not wet the surface of a solid if its angle of contact is

a. Zero b. less than 90^0 c. more than 90^0 d. 90^0

14. Excess pressure of one soap bubble is 4 times the other soap bubble. Then ratio of volume of first bubble to the other is

a. 1:64 b. 1:4 c. 64:1 d. 1:2

15. A square wire frame of side L is dipped in a liquid, on taking out, a membrane is formed. If the surface tension of the liquid is T, then force acting on the frame will be

a. 2TL b. 4TL c. 8TL d. 16TL.

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