

SURFACE TENSION

Questions on Surface Tension, Paper 1

1. One end of a towel dips into a bucket full of water and other end hangs over the bucket. It is found that after some time the towel becomes fully wet. It happens (**CPMT 86**)
- Because viscosity of water is high
 - Because of the capillary action of cotton threads
 - Because of gravitational force
 - Because of evaporation of water.
- Answer: (b)**
2. For tap water and clean glass, the angle of contact is
- 0°
 - 90°
 - 140°
 - 8°
- Answer: (d)**
3. Water rises up to a height h_1 in a capillary tube of radius r . the mass of the water lifted in the capillary tube is M . if the radius of the capillary tube is doubled, the mass of water that will rise in the capillary tube will be
- M
 - $2M$
 - $\frac{M}{2}$
 - $4M$
- Answer: (b)**
4. Water rises through a height h in a capillary tube of internal radius (r). if T is the S.T. of water, then the pressure difference between the liquid level in the container and the lowest point of the concave meniscus is
- $\frac{T}{r}$
 - $\frac{r}{T}$
 - $\frac{2T}{r}$
 - $\frac{r}{2T}$
- Answer: (c)**
5. A number of small drops of mercury coalesce adiabatically to form a single drop. The temperature of drop (**MHT-CET-2008**)
- Increases
 - Is infinite
 - Remains unchanged
 - May decrease or increase depending upon size
- Answer: (d)**
6. The angle of contact between a glass capillary tube of length 10 cm and a liquid is 90° . If the capillary tube is dipped vertically in the liquid, then the liquid
- Will rise in the tube
 - Will get depressed in the tube
 - Will rise up to 10 cm in the tube and will overflow
 - Will neither rise nor fall in the tube
- Answer: (d)**
7. When there are no external forces, the shape of a liquid drop is determined by
- Surface tension of the liquid
 - Density of liquid
 - Viscosity of liquid
 - Temperature of air only
- Answer: (a)**
8. If T is surface tension of soap solution, the amount of work done in blowing a soap bubble from diameter D to a diameter $2D$ is (**PMT MP 90**)
- $2\pi D^2 T$
 - $4\pi D^2 T$
 - $6\pi D^2 T$
 - $8\pi D^2 T$
- Answer: (c)**
9. Choose the wrong statement from the following.
- Small droplets of a liquid are spherical due to surface tension
 - Oil rises through the wick due to capillarity
 - In drinking the cold drinks through a straw, we use the phenomenon of capillarity
 - Gum is used to stick two surfaces. In this process we use the property of Adhesion
- Answer: (c)**
10. If the surface of a liquid is plane, then the angle of contact of the liquid with the walls of container is (**MHT CET 2004**)
- Acute angle
 - Obtuse angle
 - 90°
 - 0°
- Answer: (d)**
11. A capillary tube when immersed vertically in a liquid records a rise of 3 cm. if the tube is immersed in the liquid at an angle of 60° with the vertical, then length of the liquid column along the tube will be (**MHT-CET 1999**)
- 2 cm
 - 3 cm
 - 6 cm
 - 9 cm
- Answer: (c)**
12. If sap bubbles of different radii are in communication with each other (**PMT MP 88, NCERT 80**)
- Air flow from the larger bubble into the smaller one until the two bubbles are of equal size
 - The sizes of the bubbles remain unchanged.
 - Air flows from the smaller into the larger one and larger bubble grows at the expense of the smaller one
 - Air flows from the larger into the smaller one becomes equal to that of the larger one and the large one equal to that of the smaller one.
- Answer: (c)**

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13. A capillary tube of radius r can support a liquid of weight 6.28×10^{-4} N. if the surface tension of the liquid is 5×10^{-2} N/m. the radius of capillary must be
(CPMT 88)
(a) 2.5×10^{-3} m (b) 2.0×10^{-4} m
(c) 1.5×10^{-3} m (d) 2.0×10^{-3} m
Answer: (d)
14. The work done in blowing a soap bubble of radius R is W_1 and that to a radius $3R$ is W_2 . the ratio of work done is
(a) 1:3 (b) 3:1
(c) 1:9 (d) 9:1
Answer: (c)
15. When the angle of contact between a solid and a liquid is 90° , then
(a) Cohesive force > Adhesive force
(b) Cohesive force < Adhesive force
(c) Cohesive force = Adhesive force
(d) Cohesive force \gg Adhesive force
Answer: (c)
16. Rain drops are spherical in shape because of (MHT-CET 2000)
(a) Surface tension
(b) Capillary
(c) Downward motion
(d) Acceleration due to gravity
Answer: (a)
17. A sheet can be made water proof by coating it with a substance that changes the angle of contact
(a) to $\frac{\pi}{2}$
(b) To zero
(c) From acute to obtuse
(d) From obtuse to acute
Answer: (c)
18. Water rises in a capillary tube to a certain height such that the upward force due to surface tension is balanced by 75×10^{-4} N, forces due to the weight of the liquid. If the surface tension of water is 6×10^{-2} N/m, the inner-circumference of the capillary must be (CPMT 88, 86)
(a) 1.25×10^{-2} m (b) 0.50×10^{-2} m
(c) 6.5×10^{-2} m (d) 12.5×10^{-2} m
Answer: (d)
19. What is the change in surface energy, when a mercury drop of radius R splits up into 1000 droplets of radius r ?
(a) $8 \pi R^2 T$ (b) $16 \pi R^2 T$
(c) $24 \pi R^2 T$ (d) $36 \pi R^2 T$
Answer: (d)
20. Which of the following is not based one the principle of capillarity (MHT CET 2005)
(a) Floating of wood on eater surface
(b) Ploughing of soil
(c) Rise of oil in wick of lantern
(d) Soaking of ink by bloating paper
Answer: (a)
21. The rise of a liquid in a capillary tube does not depend upon
(a) Angle of contact
(b) Density of the liquid
(c) Radius of the capillary tube
(d) Atmospheric pressure
Answer: (d)
22. The height of water in a capillary tube of radius 2 cm is 4 cm. what should be the radius of capillary, if the water rises to 8 cm in tube? (MHT-CET-2001)
(a) 1 cm (b) 0.1 cm
(c) 2 cm (d) 4 cm
Answer: (a)
23. The work done to get 'n' smaller equal size spherical drops from a bigger size spherical size drop of water is proportional to (EAMCET 91)
(a) $\frac{1}{n^3} - 1$ (b) $\frac{1}{n} - 1$
(c) $\frac{1}{n^3} - 1$ (d) $\frac{4}{n^3} - 1$
Answer: (c)
24. For a liquid, which is rising in a capillary tube, the angle of contact is
(a) 90° (b) 180°
(c) Acute (d) Obtuse
Answer: (c)
25. W is the work done, when a bubble of volume V is formed from a solution. How much work is required to be done to form a bubble of volume $2V$?
(a) $2W$ (b) W
(c) $2^{1/3}W$ (d) $4^{1/3}W$
Answer: (d)