Questions on Surface Tension, Paper 3

1. A drop of liquid of diameter 2.8 mm beaks up into 125 identical drops. The change in energy is nearly (S.T. of liquid = 75×10^{-3} N/m) **(CPMT 89)**
   (a) Zero
   (b) 19×10^{-7} J
   (c) 46×10^{-7} J
   (d) 74×10^{-7} J
   Answer: (d)

2. Amount of energy required to blow a bubble of radius 5 cm, is (Surface tension of soap is 30×10^{-2} N/m)
   (MHT-CET-2002)
   (a) 1.88 J
   (b) 1.88×10^{-1} J
   (c) 1.88×10^{-2} J
   (d) 1.88×10 J
   Answer: (c)

3. The surface tension of a liquid is T. the increase in its surface energy on increasing the surface area by A is **(MPPET-91)**
   (a) AT^{-1}
   (b) AT
   (c) A^2T
   (d) A^2T^2
   Answer: (b)

4. A liquid does not wet the surface of a solid if the angle of contact is **(AFMC Pune 88)**
   (a) Zero
   (b) An acute one
   (c) 45°
   (d) An obtuse one
   Answer: (d)

5. The pressure just below the meniscus of water
   (NCERT 76)
   (a) Is greater than just above it
   (b) Is less than just above it
   (c) Is same as just above it
   (d) Is always equal to atmospheric pressure.
   Answer: (b)

6. 5 g of water rises in the bore of capillary tube when it is dipped in water. If the radius of bore capillary tube is doubled, the mass of water that rises in the capillary tube above the outside water level is
   (MHT-CET 2001)
   (a) 1.5 g
   (b) 10 g
   (c) 5 g
   (d) 15 g
   Answer: (b)

7. When a capillary tube is immersed vertically in water the capillary rise is 3 cm. if the same capillary tube is inclined at angle of 60° to the vertical, the length of the water column in the capillary tube above that of the outside level is
   (MHT CET 2003)
   (a) 6 cm
   (b) 1 cm
   (c) 8 cm
   (d) Zero
   Answer: (a)

8. Water rises up to a height of 5 cm in a capillary tube of radius 2 mm. what is the radius of the radius of the capillary tube if the water rises up to a height of 10 cm in another capillary?
   (a) 4 mm
   (b) 1 mm
   (c) 3 mm
   (d) 1 cm
   Answer: (b)

9. Water rises up to a height of 4 cm, in a capillary tube immersed vertically in water. What will be the length of water column in the capillary tube, if the tube is immersed in water, at an angle of 60° with the vertical?
   (a) 4 cm
   (b) 6 cm
   (c) 8 cm
   (d) 2 cm
   Answer: (c)

10. Work done in blowing a liquid drop to radius R is W_1 and that to radius 3R is W_2. the ratio of work done is
    (MHT-CET-2005)
    (a) 1:3
    (b) 1:4
    (c) 1:2
    (d) 1:9
    Answer: (d)

11. Potential energy of a molecule on the surface of a liquid is as compare to another molecule inside of the liquid is
    (MHT-CET-2008)
    (a) More
    (b) Less
    (c) Both 'a' and 'b'
    (d) None of these
    Answer: (a)

12. Rain drops are spherical because of **(MHT CET 2002)**
    (a) Gravitational force
    (b) Surface tension
    (c) Air resistance
    (d) Low viscosity of water
    Answer: (b)

13. Pressure inside two soap bubbles is 1.01 and 1.02 atmospheres. ratio between their volume is
    (PMT 91)
    (a) 102:101
    (b) $(102)^3:(101)^3$
    (c) 8:1
    (d) 2:1
    Answer: (c)

14. Excess pressure inside a bubble of radius r and of a liquid of surface tension T is **(MHT CET 2000)**
    (a) $\dfrac{T}{r}$
    (b) $\dfrac{2T}{r}$
    (c) $\dfrac{3T}{r}$
    (d) $\dfrac{4T}{r}$
    Answer: (d)

15. A square frame of side l is dipped in a liquid soap when it is taken out of the liquid, a film is formed on it. If surface tension is T then force acting on it is
    (MHT CET 99)
    (a) 2T l   (b) 8T l
    (c) 4T l   (d) 16T l
    Answer: (b)

16. Two soap bubbles with radii 3 cm and 4 cm combine to form a bubble of large radius R, under isothermal condition. Then R is approximately equal to
    (MHT CET 2001)
    (a) $(3^3 + 4^3)^{1/3}$ cm   (b) $(3^3 + 4^3)^{1/2}$ cm
    (c) $(3^2 + 4^2)^{1/2}$ cm   (d) $(3^3 + 4^2)^{1/3}$ cm
    Answer: (c)

17. Meniscus of mercury in capillary is **(PMT MP 88)**
    (a) Concave   (b) Convex
    (c) Plane   (d) Cylindrical
    Answer: (b)

18. Surface tension of liquid is independent of the
    (a) Temperature of the liquid
    (b) Area of the liquid surface
    (c) Nature of the liquid
    (d) Impurities present in the liquid
    Answer: (b)

19. For a liquid which is rising in a capillary, he angle of contact is **(MHT-CET-2005)**
    (a) Obtuse   (b) Acute
    (c) 180°   (d) 90°
    Answer: (b)

20. Two capillary tubes of the same material but of different radii are dipped in a liquid. The heights to which the liquid rises in the two tubes are 2.2 cm and 6.6 cm. the ratio of radii of the tubes will be
    (MPPET 90)
    (a) 1:9   (b) 1:3
    (c) 9:1   (d) 3:1
    Answer: (d)

21. The dimension of surface tension are
    (MHT-CET-2002)
    (a) $[M\,LT^{-1}]$ (b) $[M\,L^2\,T^{-2}]$
    (c) $[M\,L^0\,T^{-2}]$ (d) $[M\,L^{-1}\,T^{-2}]$
    Answer: (c)

22. Two soap bubbles have radii in the ratio 2:1. What is the ratio excess of pressure inside them?
    (NCERT 90)
    (a) 1:2   (b) 2:1
    (c) 1:4   (d) 4:1
    Answer: (a)

23. Water rises to a height of 2 cm in a capillary tube held vertically. When the tube is tilted 60° from the vertical, the length of the water column in the tube will be
    (MHT-CET 99)
    (a) 2 CM   (b) 1 CM
    (c) 3 CM   (d) 4 CM
    Answer: (d)

24. Find the difference of air pressure between the inside and out side of a soap bubble of 5 mm diameter, if the surface tension is 1.6 N/m **(CPMT 92)**
    (a) 2560 N/m^2 (b) 3720 N/m^2
    (c) 1208 N/m^2 (d) 10132 N/m^2
    Answer: (a)

25. For a water does not wet a glass rod, the angle of contact is **(MHT-CET-2006)**
    (a) Obtuse   (b) Acute
    (c) 0°   (d) 90°
    Answer: (a)