PHYSICS

BOOKS - UNIVERSAL BOOK DEPOT

1960 PHYSICS (HINGLISH)

SURFACE TENSION

Exercise

1. At critical temperature, the surface tension of a liquid

A. Zero

B. infinite

C. Between 0 and ∞

D. Can not be determined

Answer: A

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2. The rain are in spherical shape due to

A. Density of the liquid

B. surface tension

C. Atmospheric pressure

D. Gravity

Answer: B

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3. Surface tension is due to

A. Frictional force between molecules

B. Cohesive forces between molecules

C. Adhesive force between molecules

D. Gravitational forces

Answer: B

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4. When there is no external force, the shape of a liquid drop is determined by

A. Surface tension of the liquid

B. Density of liquid

C. Viscocity of liquid

D. Temperature of air only

Answer: A

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5. Soap helps in cleaning clothes, because

A. Chemical s of soap change

B. it increase the surface tension of the solution

C. It absorbs the dirt

D. it lowers the surface tension of the solution

Answer: D

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6. When a greased iron needle is placed gently on the surface of water at rest, it floats on the surface of water. Why?

A. Surface tension

B. Less weight

C. Upthrust of liquid

D. none of these

Answer: A

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7. Coating used on raincoat are waterproof because

A. Water is absorbed by the coating

B. cohesive force becomes greater

C. Water is not scattered away by the coating

D. Angle of contact decreass

Answer: B

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8. If temperature increases, the surface tension of a liquid

A. increases

B. Decreases

C. Remains the same

D. Increases then decreases

Answer: B

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9. A drop of oil is placed on the surface of water. Which of the following statements is correct

A. It will remain on it as a sphere

B. It will spread as a thin layer

C. It will be partly as spherical drouplets and partly as thin film

D. It will float as a distorted drop on the water

Answer: B

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10. The temperature at which the surface tension of water is zero

(1) $370^\circ C$

(2) $0^\circ C$

(3) Slightly less than $647K$

(4) $277K$

A. $0^\circ C$

B. 277 K

C. $370^\circ C$

D. Slightly less than 647 K

Answer: C::D

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11. A small air bubble is at the inner surface of the bottom of a beaker filled with cold water. Now water of the beaker is heated. The size of bubble increases. The reason for this may be

A. Increases in the saturated vapour pressrue of water

B. Root mean square velocity of air molecules inside the bubble increases

C. Decreases in surface tension of water

D. all of the above

Answer: D

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12. The spider and insect move and run about on the surface of water without sinking because

A. Elastic membrane is formed on water due to property of surface tension

B. Spiders and insects are lighter

C. Spiders and insects swim on water

D. Spider and insects experience upthrust

Answer: A

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13. Small droplets of a liquid are usually more spherical in shape than larger drops of the same liquid because

A. Force of surface tension is equal and opposite to the force of gravity

B. Force of surface tension predominates the force of gravity

C. Force of gravity predominates the force of surface tension

D. Force of gravity and force of surface tension act in the same direction and are equal

Answer: B

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14. When a shaving brush is taken out of water its hair cling together, why?

A. Force of attraction between hair

B. Surface tension

C. Viscosity of water

D. Characteristic property of hairs

Answer: B

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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 liquid is T, the force acting on the frame due to the membrane will be

A. 2TL

B. 4TL

C. 8 TL

D. 10 TL

Answer: C

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16. Water does not wet an oily glass because

A. Cohesive force of oilgtgt adhesive force between oil and glass

B. Cohesive force of oil gt cohesive force of water

C. Oil repels water

D. Cohesive force for water 'gt' adhesive force between water and oil molecules

Answer: D

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17. A water drop takes the shape of a sphere in a oil while the oil drop spreads in water, because

(A.F.=adhesive force C.F.=Cohesive force)

A. C.F. for water gt A.F. for water and oil

B. C.F. for oil gt A.F. for water and oil

C. C.F. for oil lt A.F. for water and oil

D. none of these

Answer: A

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18. Which of the fact is not due to surface tension

A. Dancing of a camphor piece over the surface of water

B. Small mercury drop itself becomes spherical

C. A liquid surface comes at rest after stirring

D. Mercury does not wet the glass vessel

Answer: C

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19. In the glass capillary tube, the shape of the surface of the liquid depends upon

A. Only on the cohesive force of liquid molecules

B. Only on the adhesive force between the molecules of glass and liquid

C. Only on relative cohesive and adhesive force between the atoms

D. Neither on cohesive nor on adhesive force

Answer: C

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20. Force necessary to pull a circular plate of 5cm radius from water surface for which surface tension is 75 dynes/cm, is ?

A. 30 dynes

B. 60 dynes

C. 750 dynes

D. 750 π dynes

Answer: D

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21. The property of surface tension is obtained in

A. Solids, liquids and gases

B. Liquids

C. gases

D. Matter

Answer: B

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22. The surface tension of a liquid ___ with rise of temperature.

A. increase with area

B. Decreases with area

C. Increase with temperature

D. Decrease with temperature

Answer: D

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23. If two glass plates are quite nearer to each other in water, then there will be force of

A. Attraction

B. Repulsion

C. Attraction or repulsion

D. none of these

Answer: A

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24. On mixing the salt in water, the surface tension of water will

A. Increases

B. Decreases

C. Remains unchanged

D. None of the above

Answer: A

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25. The maximum force, in addition to the weight required to pull a wire of $5.0cm$ long from the surface of water at temperature

$20^\circ C$, is 728 dynes. The surface tension of water is

A. 7.28 N/cm

B. 7.28 dyne/cm

C. 72.8 dyne/cm

D. 7.28×10^2dyne/cm

Answer: C

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26. Consider a liquid contained in a vessel. The liquid solid adhesive force is very weak as compared to the cohesive force in the liquid. The shape of the liquid surface near the solid shall be

A. Horizontal

B. Almost vertical

C. Concave

D. Convex

Answer: D

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

A. $4^\circ C$

B. $25^\circ C$

C. $50^\circ C$

D. $75^\circ C$

Answer: D

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28. If a glass rod is dipped in mercury and withdrawn out, the mercury does not wet the rod because

A. Angle of contact is acute

B. Cohesion force is more

C. Adhesion force is more

D. Density of mercury is more

Answer: B

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29. 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 $90^\circ C$

D. Cohesive force is equal to adhesive force

Answer: B

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30. Surface tension of a liquid is found to be influenced by

A. It increases with the increase of temperature

B. Nature of the liquid in contact

C. Presence of soap that increases it

D. Its variation with the concentration of the liquid

Answer: D

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31. When a drop of water is dropped on oil surface, then

A. It will mix up with oil

B. It spreads in the form of a film

C. It will deform

D. It remains spherical

Answer: D

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32. Two pieces of glass plate one upon the other with a little water between them cannot be separated easily because of

A. Inertia

B. Pressure

C. Surface tension

D. Viscocity

Answer: C

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33. Small droplets of a liquid are usually more spherical in shape than larger drops of the same liquid because

A. Atmospheric pressure exerts a force on a liquid drop

B. Volume of a spherical drop is minimum

C. Gravitational force acts upon the drop

D. Liquid tends to have the minimum surface area due to surface tension

Answer: D

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34. A thin metal disc of radius r floats on water surface and bends the surface downwards along the perimeter making an angle θ with vertical edge of the disc. If the disc dispplaces a weight of water W and surface tension of water is T, then the weight of metal disc is

A. $2\pi rT + W$

B. $2\pi rT\cos\theta - W$

C. $2\pi rT\cos\theta + W$

D. $W - 2\pi rT\cos\theta$

Answer: C

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35. A 10 cm long wire is placed horizontally on the surface of water and is gently pulled up with a force of $2 \times 10^{-2} N$ to keep the wire in equilibrium. The surface tension of water in $\frac{N}{m}$ is

A. 0.1

B. 0.2

C. 0.001

D. 0.002

Answer: A

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36. It is better to wash the clothes in hot soap solution. Why?

A. Surface tension is more

B. Surface tension is less

C. Consumes less soap

D. None of these

Answer: B

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37. Due to which of water, tiny particles of camphor dance on the surface of water

A. Viscocity

B. surface tension

C. Weight

D. Floating force

Answer: B

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38. Calculate the force required to separate the glass plates of area $10^{-2}m^2$ with a film of water 0.05 mm thickness between them

(surface tension of water $= 70 \times 10^{-3} N/m$))

A. 28 N

B. 14 N

C. 50 N

D. 38 N

Answer: A

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39. Oil spreads over the surface of water whereas water does not spread over the surface of the oil, due to

A. Surface tension of water is very high

B. Surface tension of water is very low

C. Viscosity of oil is high

D. Viscosity of water is high

Answer: A

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40. Cohesive force is experienced between

A. Magnetic substances

B. Molecules of different substances

C. Molecules of same substances

D. None of these

Answer: C

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41. The property utilized in the manufacture of lead shots is

A. Specific weight of liquid lead

B. Specific gravity of liquid lead

C. Compressibility of liquid lead

D. Surface tension of liquid lead

Answer: D

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42. The dimensions of surface tension are

A. $\left[MLT^{-1}\right]$

B. $\left[ML^{2}T^{-2}\right]$

C. $\left[ML^{0}T^{-2}\right]$

D. $\left[ML^{-1}T^{-2}\right]$

Answer: C

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43. A wooden stick 2m long is floating on the surface of water. The surface tension of water 0.07 N/m. By putting soap solution on one side of the sticks the surface tension is reduced to 0.06 N/m. The net force on the stick will be

A. 0.07 N

B. 0.06 N

C. 0.01 N

D. 0.02 N

Answer: D

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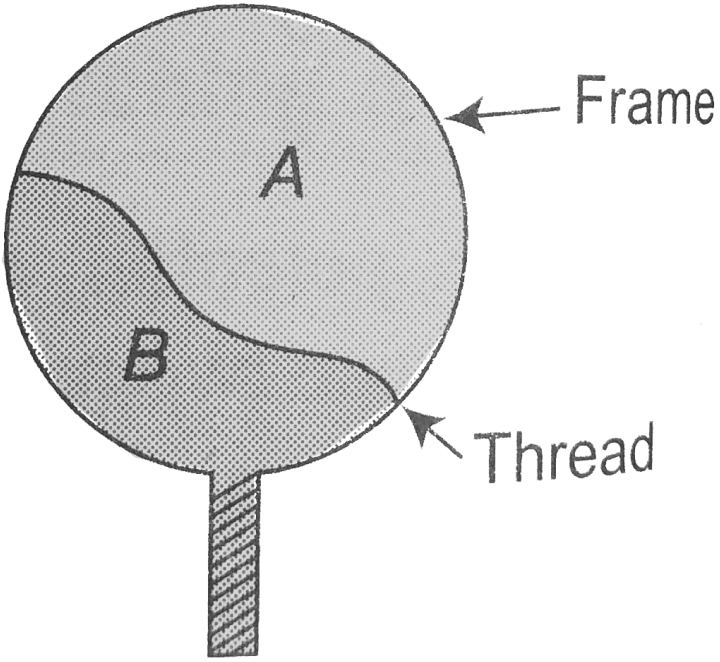

44.

A thread is tied slightly loose to a wire frame

as in figure and the frame is dipped into a soap solution and taken out . The frame is comletely covered with the film. When the portion A puntured with a pin The thread.

A. Becomes concave toward A

B. Becomes convex towards A

C. Remains in the initial position

D. Either (a) or (b) depending on the size of A w.r.t. B

Answer: A

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45. The force required to take away a flat circular plate of radius 2 cm from the surface of water, will be (the surface tension of water is 70 dyne/cm)

A. 280π dyne

B. 250π dyne

C. 140π dyne

D. 210π dyne

Answer: A

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46. Surface tension may be defined as

A. The work done per unit area in increasing the surface area of a liquid under isothermal condition

B. The work done per unit area in increasing the surface area of a liquid

under adiabatic condition

C. The work done per unit area in increasing the surface area of a liquid under both isothermal and adiabatic conditions

D. Free surface energy per unit volume

Answer: A

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47. Energy needed in breaking a drop of radius R into n drops of radii r is given by

A. $4\pi T\left(nr^2 - R^2\right)$

B. $\frac{4}{3}\pi\left(r^3 n - R^2\right)$

C. $4\pi T\left(R^2 - nr^2\right)$

D. $4\pi R\left(nr^2 + R^2\right)$

Answer: A

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48. The potential energy of molecule on the surface of a liquid as compared to in side the liquid is

A. Zero

B. smaller

C. The same

D. Greater

Answer: D

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49. Two water droplets merge with each other to from a larger droplet. In this proces

A. Energy is liberated

B. Energy is absorbed

C. Neither liberated nor absorbed

D. Some mass is converted into energy

Answer: A

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50. A drop of liquid of diameter 2.8 mm breaks up into 125 identical drops. The change in energy is nearly (S.T. of liquid =75 dynes / cm)

A. Zero

B. 19 erg

C. 46 erg

D. 74 erg

Answer: D

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51. Radius of a soap bubble is 'r ', surface tension of soap solution is T. Then without increasing the temperature, how much energy will be needed to double its radius

A. $4\pi r^2 T$

B. $2\pi r^2 T$

C. $12\pi r^2 T$

D. $24\pi r^2 T$

Answer: D

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52. The work done in splitting a drop of water of 1 mm radius into 10^6 drops is (S.T. of water $= 72 \times 10^{-3} J/m^2$)

A. $9.58 \times 10^{-5} J$

B. $8.95 \times 10^{-5} J$

C. $5.89 \times 10^{-5} J$

D. $5.98 \times 10^{-6} J$

Answer: B

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53. A spherical liquid drop of radius R is divided into eight equal droplets. If the surface tension is T, then the work done in this process will be

A. $2\pi R^2 T$

B. $3\pi r^2 T$

C. $4\pi r^2 T$

D. $2\pi R^2 T$

Answer: C

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54. The amount of work done in blowing a soap bubble such that its diameter increases from d to D is (T=surface tension of the solution)

A. $4\pi\left(D^2-d^2\right)T$

B. $8\pi\left(D^2-d^2\right)T$

C. $\pi\left(D^2-d^2\right)T$

D. $2\pi\left(D^2 - d^2\right)T$

Answer: D

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55. If T is the surface tension of soap solution, the amount of work done in blowing a soap bubble from a diameter D to 2D is

A. $2\pi D^2 T$

B. $4\pi D^2 T$

C. $6\pi D^2 T$

D. $8\pi D^2 T$

Answer: C

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56. The radius of a soap bubble is increased from $\frac{1}{\sqrt{\pi}}$ cm to $\frac{2}{\sqrt{\pi}}$ cm. If the surface tension of water is 30dynes per cm, then the work done will be

A. 180 ergs

B. 360 ergs

C. 720 ergs

D. 960 ergs

Answer: C

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57. The surface tension of a liquid is $5Nm^{-1}$. If a thin film formed on a loop of area $0.02m^{-2}$ then its surface energy will be

A. $5 \times 10^2 J$

B. $2.5 \times 10^{-2} J$

C. $2 \times 10^{-1} J$

D. $5 \times 10^{-1} J$

Answer: C

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58. If work W is done in blowing a bubble of radius R from a soap solution. Then the work

done is blowing a bubble of radius $2R$ from the same solution is

A. W/2

B. 2W

C. 4W

D. $2\frac{1}{3}W$

Answer: C

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59. A spherical drop of oil of radius 1 cm is broken into 1000 droplets of equal radii. If the surface tension of oil is 50 dynes / cm , the work done is

A. 18π ergs

B. $180\pi ergs$

C. $1800\pi ergs$

D. $8000\pi ergs$

Answer: C

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60. The work done in blowing a soap bubble of radius r of the solution of surface tension T will be

A. $8\pi r^2 T$

B. $2\pi r^2 T$

C. $4\pi r^2 T$

D. $\frac{4}{3}\pi r^2 T$

Answer: A

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61. If two identical mercury drops are combined to form a single drop, then its temperature will

A. Decreases

B. Increases

C. Remains the same

D. None of the above

Answer: B

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62. If the surface tension of a liquid is T , the gain in surface energy for an increase in liquid surface by A is

A. AT^{-1}

B. AT

C. A^2T

D. A^2T^{-2}

Answer: B

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63. The surface tension of a soap solution is $2 \times 10^{-2} N/m$. To blow a bubble of radius 1cm, the work done is

A. $4\pi \times 10^{-6} J$

B. $8\pi \times 10^{-6} J$

C. $12\pi \times 10^{-6} J$

D. $16\pi \times 10^{-6} J$

Answer: D

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64. A mercury drop of radius 1 cm is broken into 10^6 droplets of equal size. The work done is $\left(T = 35 \times 10^{-2} \frac{N}{m}\right)$

A. $4.4 \times 10^{-3} J$

B. $2.2 \times 10^{-4} J$

C. $8.8 \times 10^{-4} J$

D. $10^4 J$

Answer: A

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65. The surface tension of a liquid at its boiling point is

A. Becomes zero

B. Becomes infinity

C. is equal to the value at room temperature

D. is half to the value at the room temperature

Answer: A

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66. Surface tension of a sopa solution is $1.9 \times 10^{-2} N/m$. Work done in blowing a bubble of 2.0 cm diameter will be

A. $7.6 \times 10^{-6} \pi$ joule

B. $15.2 \times 10^{-6}\pi$ joule

C. $1.9 \times 10^{-6}\pi$ joule

D. 1×10^{4} joule

Answer: B

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67. The surface tension of liquid is 0.5 N / m . If a film is held on a ring of area 0.02 m 2, its surface energy is

A. 5×10^{-2} joule

B. 2.0×10^{-2} joule

C. 4×10^{-2} joule

D. 0.8×10^{-2} joule

Answer: B

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68. What is ratio of surface energy of 1 small drop and 1 large drop, if 1000 small drops combined to form 1 large drop

A. $100:1$

B. $1000:1$

C. $10:1$

D. $1:100$

Answer: D

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69. The amount of work done in forming a soap film of size 10 cm x 10 cm is (Surface tension $T = 3 \times 10^{-2} N/m$)

A. $6 \times 10^{-4} J$

B. $3 \times 10^{-4} J$

C. $6 \times 10^{-3} J$

D. $3 \times 10^{-4} J$

Answer: A

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70. The work done in blowing a soap bubble of 10 cm radius is (Surface tension of the soap solution is $\frac{3}{100}$ N/m)

A. 75.36×10^{-4} joule

B. 37.68×10^{-4} joule

C. 150.72×10^{-4} joule

D. 75.36 joule

Answer: A

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71. A liquid drop of diameter D breaks upto into 27 small drops of equal size. If the surface

tension of the liquid is σ , then change in surface energy is

A. $\pi D^2 \sigma$

B. $2\pi D^2 \sigma$

C. $3\pi D^2 \sigma$

D. $4\pi D^2 \sigma$

Answer: B

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72. 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

A. $1000:1$

B. $1:1000$

C. $10:1$

D. $1:10$

Answer: D

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

A. 1.5×10^{-2}N/m

B. 3.0×10^{-2}N/m

C. 6.0×10^{-2} N/m

D. 11.0×10^{-2} N/m

Answer: B

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74. If σ be the surface tension, the work done in breaking a big drop of radius R in n drops of equal radius is

A. $Rn^{2/3}\sigma$

B. $\left(n^{2/3}-1\right)R\sigma$

C. $\left(n^{1/3}-1\right)R\sigma$

D. $4\pi R^2\left(n^{1/3}-1\right)\sigma$

Answer: D

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75. A big drop of radius R is formed by 1000 small droplets of water, then the radius of small drop is

A. R/2

B. R/5

C. R/6

D. R/10

Answer: D

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76. When 10^6 small drops coalesce to make a larger drop them the drop

A. Density increases

B. Density decreases

C. Temperature increases

D. Temperature decreases

Answer: C

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77. Which of the following statements are true in case when two water drops coalesce and make a bigger drop?

(1) Energy is released.

(2) Energy is absorbed.

(3) The surface area of the bigger drop is smaller than the sum of the surface areas of both the drops.

(4) The surface area of the bigger drop is greater than the sum of the surface areas of both the drops.

A. Energy is released

B. Energy is absorbed

C. The surface area of the bigger drop is greater than the sum of the surface areas of both the drops

D. The surface area of the bigger drop is smaller than the sum of the surface

areas of both the drops

Answer: A::D

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78. 8000 identical water drops combine together to form a big drop. Then the ratio of the final surface energy of all the initial surface energy of all the drops together is

A. $1:10$

B. $1:15$

C. $1:20$

D. $1:25$

Answer: C

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79. The surface energy of liquid film on a ring of area $0.15m^2$ is (surface tension of liquid $5Nm^{-1}$)

A. 0.75 J

B. 1.5 J

C. 2.25 J

D. 3.0 J

Answer: B

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80. 8 mercury drops coalesce to form one mercury drop, the energy changes by a factor of

A. 1

B. 2

C. 4

D. 5

Answer: C

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81. If work done in increasing the size of a soap film from 10 cm x 6 cm to 10 cm x 11 cm is $2 \times 10^{-4} J$, then the surface tension is

A. $2 \times 10^{-2} Nm^{-1}$

B. $2 \times 10^{-4} Nm^{-1}$

C. $2 \times 10^{-6} Nm^{-1}$

D. $2 \times 10^{-8} Nm^{-1}$

Answer: A

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82. A mercury drop of radius 1 cm is sprayed into 10^6 drops of equal size. The energy

expended in joule is (surface tension of mercury is $\left(460 \times 10^{-3} N/m\right)$

A. 0.057

B. 5.7

C. 5.7×10^{-4}

D. 5.7×10^{-6}

Answer: A

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83. When two small bubbles join to form a bigger one, energy is

A. Released

B. Absorbed

C. Both (a) and (b)

D. None of these

Answer: A

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84. A film of water is formed between two straight parallel wires of length 10 cm each separated by $0.5cm$ If their separation is increased by $1mm$ while still maintaining their parallelism, how much work will have to be done (Surface tension of water $= 7.2 \times 10^{-2} \frac{N}{m}$)

A. 7.22×10^{-6} joule

B. 1.44×10^{-5} joule

C. 2.88×10^{-5} joule

D. 5.76×10^{-5} joule

Answer: B

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85. A drop of mercury of radius 2 mm is split into 8 identical droplets. Find the increase in surface energy. Surface tension of mercury $= 0.465 Jm^{-2}$

A. 23.4 μJ

B. $18.5 \mu J$

C. $26.8 \mu J$

D. $16.8\mu J$

Answer: A

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86. Two small drop of mercury, each of radius R coalesce in from a simple large drop. The ratio of the total surface energies before and after the change is

A. $1 : 2^{1/3}$

B. $2^{1/3}:1$

C. $2:1$

D. $1:2$

Answer: B

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87. Radius of a soap bubble is increased from R to 2 R work done in this process in terms of surface tension is

A. $24\pi R^2 S$

B. $48\pi R^2 S$

C. $12\pi R^2 S$

D. $36\pi R^2 S$

Answer: A

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88. The work done in blowing a soap bubble of radius 0.2 m is (the surface tension of soap solution being 0.06 N/m)

A. $192\pi \times 10^{-4} J$

B. $280\pi \times 10^{-4} j$

C. $200\pi \times 10^{-3}$ j

D. None of these

Answer: A

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89. A liquid film is formed in a loop of area 0.05 m 2. Increase in its potential energy will be (T = 0.2 N/m)

A. $5 \times 10^{-2} J$

B. 2×10^{-2} J

C. $3 \times 10^{-2} J$

D. None of these

Answer: B

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90. In order to float a ring of area 0.04 m in a liquid of surface tension 75 N/m, the required surface energy will be

A. 3J

B. 6.5 J

C. 1.5 J

D. 4J

Answer: A

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91. If two soap bubbles of equal radii r coalesce then the radius of curvature of interface between two bubbles will be

A. r

B. 0

C. inifinity

D. 1/2r

Answer: C

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

A. Zero

B. Obtuse (More than 90°)

C. Acute (Less than 90°)

D. 90°

Answer: B

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93. The meniscus of mercury in the capillary tube is

A. Convex

B. Concave

C. Plane

D. Uncertain

Answer: A

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94. When the temperature increased the angle of contact of a liquid

A. Increases

B. Decreases

C. Remains the same

D. First increases and then decreases

Answer: B

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95. The angle of contanct between glass and mercury is

A. 0°

B. 30°

C. 90°

D. 135°

Answer: D

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96. A mercury drop does not spread on a glass plate because the angle of contact between glass and mercury is

A. Acute

B. Obtuse

C. zero

D. 90°

Answer: B

Watch Video Solution

97. A liquid is coming out from a vertical tube. The relation between the weight of the drop W , surface tension of the liquid T and radius

of the tube r is given by, if the angle of contact is zero

A. $W = \pi r^2 T$

B. $W = 2\pi r T$

C. $W = 2r^2 \pi T$

D. $W = \frac{3}{4}\pi r^3 T$

Answer: B

Watch Video Solution

98. The parts of motor cars are polished by chromium because the angle of contact between water and chromium is

A. 0°

B. 90°

C. Less than 90°

D. Greater than 90°

Answer: D

Watch Video Solution

99. A glass plate is partly dipped vertically in the mercury and the angle of contact is measured. If the plate is inclined, then the angle of contact will

A. Increases

B. Remain unchanged

C. increases or decreases

D. Decreases

Answer: B

Watch Video Solution

100. The liquid meniscus in a capillary tube will be convex, if the angle of contact is

A. Greater than 90°

B. Less than 90°

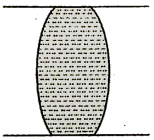
C. Equal to 90°

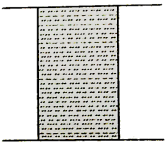
D. Equal to 0°

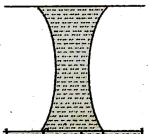
Answer: A

 Watch Video Solution

101. If a water drop is kept between two glass plates, then its shape is

A. 

B. 

C. 

D. None of these

Answer: C

Watch Video Solution

102. The value of contact angle for kerosene with solid surface.

A. 0°

B. 90°

C. 45°

D. 33°

Answer: A

Watch Video Solution

103. Nature of meniscus for liquid of 0° angle of contact

A. Plane

B. Parabolic

C. Semi-spherical

D. Cylinderical

Answer: C

Watch Video Solution

104. A liquid wets a solid completely. The meniscus of the liquid in a sufficiently long tube is

A. Flat

B. Concave

C. Convex

D. Cylinderical

Answer: B

Watch Video Solution

105. What is the shape when a non-wetting liquid is placed in a capillary tube

A. Concave upward

B. Convex upward

C. Concave downward

D. Convex downward

Answer: B

Watch Video Solution

106. For which of the two pairs, the angle of contact is same

A. Water and glass, glass and mercury

B. Pure water and glass, glass and alchol

C. Silver and water, mercury and glass

D. Silver and chromium, water and chromium

Answer: B

Watch Video Solution

107. If the surface of a liquid is plane, then the angle of contact of the liquid with the walls of container is

A. Acute angle

B. obtuse angle

C. 90°

D. 0°

Answer: D

Watch Video Solution

108. A soap bubble assumes a spherical surface. Which of the following statement is wrong

A. The soap film consists of two surface layers of molecules back to back

B. The bubble encloses air inside it

C. The pressure of air inside the bubble is less than the atmospheric pressure, that is why the atmospheric pressure has

compressed it equally from all sides to give it a spherical shape

D. Because of the elastic property of the film, it will tend to shrink to as small a surface area as possible for the volume it has enclosed

Answer: C

Watch Video Solution

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

A. Air flows from larger bubble into the smaller one

B. The size of the bubbles remains the same

C. Air flows from the smaller bubble into the large one and the larger bubble grows at the expense of the smaller one

D. The air flows from the larger

Answer: C

Watch Video Solution

110. The surface of soap solution is $25 \times 10^{-3} Nm^{-1}$. The excess pressure inside a soap bubble of diameter 1 cm is

A. 10 Pa

B. 20 Pa

C. 5Pa

D. None of the above

Answer: B

Watch Video Solution

111. Prove that if two bubbles of radii r_1 and $r_2(r_1 < r_2)$ come in contact with each other then the radius of curvature of the common surface $r = \frac{r_1 r_2}{r_2 - r_1}$

A. $r_2 - r_1$

B. $\frac{r_2 - r_1}{r_1 r_2}$

C. $\frac{r_1 r_2}{r_2 - r_1}$

D. $r_2 + r_1$

Answer: C

Watch Video Solution

112. The excess pressure due to surface tension in a spherical liquid drop of radius r is directly proportional to

A. r

B. r^2

C. r^{-1}

D. r^{-2}

Answer: C

Watch Video Solution

113. A long cylinderical glass vessel has a small hole of radius r at its bottom. The depth to which the vessel can be lowered vertically in a

deep water (surface tension S) without any water entering inside is

A. $4\frac{T}{\rho}rg$

B. $3\frac{T}{\rho}rg$

C. $2\frac{T}{\rho}rg$

D. $\frac{T}{\rho}rg$

Answer: C

Watch Video Solution

114. If the surface tension of a soap solution is 0.03 MKS units, then the excess of pressure inside a soap bubble of diameter 6 mm over the atmospheric pressure will be

A. Less than 40 N/m

B. Greater than 40 N/m

C. Less than

D. Greater than $20N/m$

Answer: B

Watch Video Solution

Watch Video Solution

115. The excess pressure inside a soap bubble is

A. $\frac{2T}{r}$

B. $\frac{4T}{r}$

C. $\frac{T}{2r}$

D. $\frac{T}{r}$

Answer: B

Watch Video Solution

116. The pressure of air in a soap bubble of 0.7 cm diameter is 8 mm of water above the atmospheric pressure calculate the surface tension of soap solution. (take $g = 980 cm/\sec^2$)

A. 100 dyne /cm

B. 68.66 dyne /cm

C. 137 dyne/cm

D. 150 dyne /cm

Answer: B

 Watch Video Solution

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

A. $102:101$

B. $(102):(101)$

C. $8:1$

D. $2:1$

Answer: C

Watch Video Solution

118. A capillary tube of radius r is dipped in a liquid of density ρ and surface tension S. if the angle of contanct is θ, the pressure difference between the two surface in the beaker and the capillary ?

A. $\frac{S}{r}cos\theta$

B. $\frac{2S}{r}\cos\theta$

C. $\frac{S}{r\cos\theta}$

D. $\frac{2S}{r\cos\theta}$

Answer: B

Watch Video Solution

119. Two spherical soap bubbles of radii r_1 and r_2 in vacuume coalesce under isothermal condition. The resulting bubble has radius R such that

A. $R = (r_1 + r_2)/2$

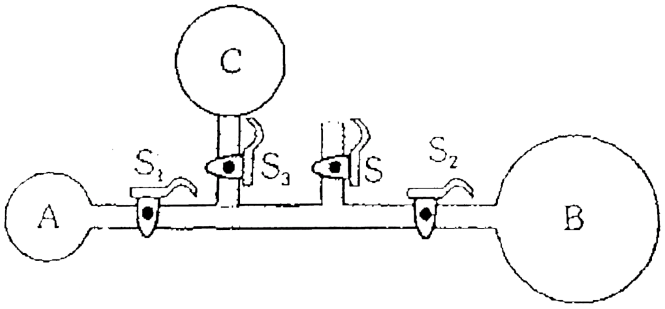
B. $R = r_1(r_1 r_2 + r_2)$

C. $R^2 = r_1^2 + r_2^2$

D. $R = r_1 + r_2$

Answer: C

Watch Video Solution



120.

The adjoining diagram shows three soap bubbles, A , B and C prepared by blowing the capillary tube fitted with stop cocks S, S_1, S_2 and S_3 with stop cock S closed and stop cocks S_1, S_2 and S_3 opened-

A. B will start collapsing with volumes of A and C increasing

B. C will start collapsing with volumes of A and B increasing

C. C and A both will start collapsing with the volume of B increasing

D. Volumes of A, B and C will becomes equal at equilibrium

Answer: C

Watch Video Solution

121. When a large bubble rises from the bottom of a lake to the surface its radius doubles. If atmospheric pressure is equal to that of column of water height H then the depth of lake is

A. H

B. 2H

C. 7H

D. 8H

Answer: C

Watch Video Solution

122. A soap bubble in vacuum has a radius of 3 cm ad another soap bubble in vacuum has a radius of 4 cm. if the two bubbles coalesce under isothermal condition, then the radius of the new bubble is

A. 2.3 cm

B. 4.5 cm

C. 5 cm

D. 7 cm

Answer: C

Watch Video Solution

123. 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

A. 5 m

B. 10 m

C. 15 m

D. 20 m

Answer: C

Watch Video Solution

124. Excess pressure inside one soap bubble is four times that of other. Then the ratio of volume of first bubble to second one is

A. $1:64$

B. $1:4$

C. $64:1$

D. $1:2$

Answer: A

Watch Video Solution

125. There are two liquid drops of different radii. The excess pressure inside over the outside is

A. More in the big drop

B. More in the small drop

C. Equal in both drops

D. There is no excess pressure inside the drops

Answer: B

Watch Video Solution

126. If pressure at half the depth of a lake is equal to 2//3 pressure at the bottom of the lake then what is the depth of the lake ?

A. 10 m

B. 20 m

C. 60 m

D. 30m

Answer: B

Watch Video Solution

127. If the radius of a soap bubble is four times that of another, then the ratio of their pressures will be

A. $1:4$

B. $4:1$

C. $16:1$

D. $1:16$

Answer: A

Watch Video Solution

128. A spherical drop of water has $1mm$ radius. If the surface tension of water is $70 \times 10^{-3} N/m$, then the difference of pressure between inside and outside of the spherical drop is:

A. $35N/m^{-2}$

B. $70N/m^2$

C. $140N/m^2$

D. zero

Answer: C

Watch Video Solution

129. The pressure at the bottom of a tank containing a liquid does not depend on

A. Acceleration due to gravity

B. Height of the liquid column

C. Area of the bottom surface

D. Nature of the liquid

Answer: C

Watch Video Solution

130. In capillary pressure below the curved surface of water will be

A. Equal to atmospheric

B. Equal to upper side pressure

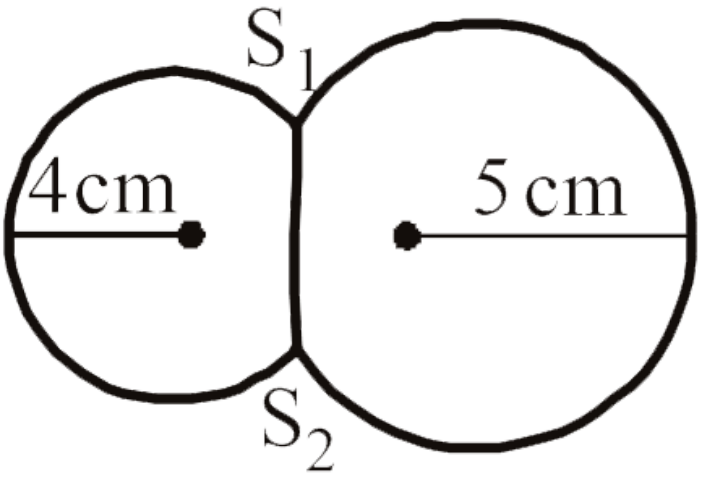
C. More than upper side pressure

D. Lesser than upper side pressure

Answer: D

Watch Video Solution

131. Two soap bubbles of radii r_1 and r_2 equal to 4 cm and 5 cm are touching each other over a common surface S_1S_2 (shown in figure). Its radius will be



A. 4 cm

B. 20 cm

C. 5 cm

D. 4.5 cm

Answer: B

Watch Video Solution

132. The pressure inside a small air bubble of radius 0.1mm situated just below the surface of water will be equal to [Take surface tension

of water $70 \times 10^{-3} Nm^{-1}$ and atmospheric pressure $= 1.013 \times 10^5 Nm^{-2}$]

A. $2.054 \times 10^3 Pa$

B. $1.027 \times 10^3 Pa$

C. $1.027 \times 10^5 Pa$

D. $2.054 \times 10^5 Pa$

Answer: C

Watch Video Solution

133. Tow soap bubbles A and B are formed at the two open ends of a tube. The bubble A is smaller then bubble B. If the valve on the tube connecting the two bubbles is opened and air can flow freely between the bubbles, then

A. The size of A will increases

B. The size of B will increases

C. The size of B will increases until the pressure equals

D. None of these

Answer: A

Watch Video Solution

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

A. Internal pressure of the smaller bubble is higher than the internal pressure of the larger bubble

B. Pressure of the larger bubble is higher than the smaller bubble

C. Both bubbles have the same internal pressure

D. None of the above

Answer: A

Watch Video Solution

135. The excess pressure inside a spherical soap bubble of radius 1 cm is balanced by a column of oil (specific gravity $= 0.8$), 2 mm high, the surface tension of the bubble is

A. 3.9 N/m

B. $3.9 \times 10^{-4} N/m$

C. $3.9 \times 10^{-4} N/m$

D. 3.9 dyne/m

Answer: B

Watch Video Solution

Watch video solution

136. In Jager's method, at the time of bursting of the bubble

A. The internal pressure of the bubble is always greater than external pressure

B. The internal pressure of the bubble is always equal to external pressure

C. The internal pressure of the bubble is always less than external pressure

D. The internal pressure of the bubble is always slightly greater than external pressure

Answer: A

 Watch Video Solution

137. The excess pressure inside a soap bubble is thrice the excess pressure inside a second soap bubble. What is the ratio between the volume of the first and the second bubble?

A. $1:3$

B. $1:9$

C. $27:1$

D. $1:27$

Answer: D

Watch Video Solution

138. When two capillary tubes of different diameters are dipped vertically, the rise of the liquid is

A. Same in both the tubes

B. More in the tube of larger diameter

C. Less in the tube of smaller diameter

D. More in the tube of smaller diameter

Answer: D

Watch Video Solution

139. A liquid rises in a capillary tube when the angle of contact is:

A. Acute

B. obtuse

C. 90°

D. zero

Answer: A

Watch Video Solution

140. In the state of weightlessness, a capillary tube is dipped in water, then water

A. Will not rise at all

B. Will rise to same height as at atmospheric pressure

C. Will rise to less height than at atmospheric pressure

D. Will rise up to the upper end of the capillary tube of any length

Answer: D

Watch Video Solution

141. Two parallel glass plates are dipped partly in the liquid of denstiy 'd' keeping them vertical. If the distance between the plates is 'x', Surface tension is T and angle of contact is θ then ries of liquid between the plates due to capillary will be

A. $\frac{T\cos\theta}{xd}$

B. $\frac{2T\cos\theta}{xdg}$

C. $\frac{2T}{xdg\cos\theta}$

D. $\frac{T\cos\theta}{xdg}$

Answer: B

Watch Video Solution

142. 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} newton force due to the weight of the liquid. If the surface tension of water is 6×10^-2` newton/metre the inner circumference of the capillary must be:

A. $1.25 \times 10^{-2} m$

B. $0.50 \times 10^{-2} m$

C. $6.5 \times 10^{-2} m$

D. $12.5 \times 10^{-2} m$

Answer: D

Watch Video Solution

143. It is not possible to write directly on blotting paper or newspaper with ink pen

A. Because of viscosity

B. Because of inertia

C. Because of friction

D. Because of capillarity

Answer: D

Watch Video Solution

144. Two capillary tubes P and Q are dipped in water. The height of water level in capillary P is

2/3 to the height in Q capillary. The ratio of their diameters is

A. $2:3$

B. $3:2$

C. $3:4$

D. $4:3$

Answer: B

Watch Video Solution

145. Two capillaries made of same material but of different radii are dipped in a liquid. The rise of liquid in one capillary is 2.2 cm and that in the other is 6.6 cm . The ratio of their radii is

A. $9:1$

B. $1:9$

C. $3:1$

D. $1:3$

Answer: C

Watch Video Solution

Watch video solution

146. Two capillaries made of the same material with radii $r_1 = 1mm$ and $r_2 = 2mm$. The rise of the liquid in one capillary ($r_1 = mm$) is 30 cm , then the rise in the other will be

A. 7.5 cm

B. 60 cm

C. 15 cm

D. 120 cm

Answer: C

Watch Video Solution

147. When a capillary is dipped in water, water rises to a heig ht h . If the length of the capillary is made less than h , then

A. The water will come out

B. The water will not come out

C. The water will not rise

D. The water will rise but less than height of capillary

Answer: B

 Watch Video Solution

148. Water rises upto 10 cm height in a long capillary tube. If this tube is immersed in water so that the height above the water surface is only 8 cm, then

A. Water flows out continously from the upper and

B. Water rises upto end and forms a spherical surface

C. Water only rises upto 6 c m height

D. Water does not rise at all

Answer: B

Watch Video Solution

149. A vessel, whose bottom has round holes with diameter of 0.1 mm , is filled with water. The maximum height to which the water can be filled without leakage is (S.T. of water =75 dyne/cm , g=1000 cm/s)

A. 100 cm

B. 75 cm

C. 50 cm

D. 30 cm

Answer: D

Watch Video Solution

150. Water rise in capillary tube when its one end is dipped vertically in it, is 3 cm. If the surface tension of water is $75 \times 10^{-3} \frac{N}{m}$, then the diameter of capillary will be (Take angle of contact $= 0^{\circ} C$)

A. 0.1 mm

B. 0.5 mm

C. 1.0 mm

D. 2.0 mm

Answer: C

Watch Video Solution

151. A capillary tube, made of glass is dipped into mercury. Then

A. Mercury rises in the capillary tube

B. Mercury rises and flows out of the capillary tube

C. Mercury descends in the capillary tube

D. Mercury neither rises nor descends in the capillary tube

Answer: C

Watch Video Solution

152. By inserting a capillary tube upto a depth l in water, the water rises to height h. if the lower end of the capillary is closed inside water and the capillary is taken out and closed

end opened, to what height the water will remain in the tube (Here $l > h$)

A. Zero

B. l+h

C. 2h

D. h

Answer: D

Watch Video Solution

153. IF the diameter of a capillary tube is doubled, then the height of the liquid that will rise is

A. Twice

B. half

C. same as earlier

D. None of these

Answer: B

Watch Video Solution

154. If the surface tension of water is 0.06 Nm, then the capillary rise in a tube of diameter 1mm is $(\theta = 0^\circ)$

A. 1.22 cm

B. 2.44 cm

C. 3.12 cm

D. 3.86 cm

Answer: B

Watch Video Solution

155. Two capillary tubes of radii 0.2 cm and 0.4 cm are dipped in the same liquid. The ratio of height through which liquid will rise in the tube is

A. $1:2$

B. $2:1$

C. $1:4$

D. $4:1$

Answer: B

Watch Video Solution

156. Two capillary tubes of radii 0.2 cm and 0.4 cm are dipped in the same liquid at an angle of 60° with the vertical. The ratio of heights through which liquid will rise in the tubes is

A. 9 cm

B. 6 cm

C. 3 cm

D. 2 cm

Answer: B

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157. The action of a nib split at the top is explained by

A. gravity flow

B. Diffusion of fluid

C. Capillar action

D. Osmosis of liquid

Answer: C

Watch Video Solution

158. The correct relation is

A. $r = \frac{2T\cos\theta}{hdg}$

B. $r = \frac{hdg}{2T\cos\theta}$

C. $r = \frac{2Tdgh}{\cos\theta}$

D. $r = \frac{T\cos\theta}{2hdg}$

Answer: A

Watch Video Solution

159. Water rises upto a height h in a capillary on the surface of earth in stationary condition. Value of h increases if this tube is taken

A. On sun

B. On poles

C. In a lift going upward with acceleration

D. In a lift going downward with acceleration

Answer: D

Watch Video Solution

160. During capillary rise of a liquid in a capillary tube, the surface of contact that remains constant is of

A. Glass and liquid

B. Air and glass

C. Air and liquid

D. All of these

Answer: C

Watch Video Solution

161. A shell having a hole of radius r is dipped in water. It holds the water upto a depth of h then the value of r is

A. $r = \frac{2T}{hdg}$

B. $r = \frac{T}{hdg}$

C. $r = \frac{Tg}{hd}$

D. None of these

Answer: A

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162. In a capillary tube, water rises by $1.2mm$. The height of water that will rise in another capillary tube having half the radius of the first, is

A. 1.2 mm

B. 2.4 mm

C. 0.6 mm

D. 0.4 mm

Answer: B

Watch Video Solution

163. If capillary experiment is performed in vacuum then for a liquid there

A. It will rise

B. Will remain same

C. It will fall

D. Rise to the top

Answer: A

 Watch Video Solution

164. If liquid level falls in a capillary then radius of capillary will

A. Increases

B. Decreases

C. Unchanged

D. None of these

Answer: A

Watch Video Solution

165. Water rises to a height h in a capillary at the surface of earth. On the surface of the moon the height of water column in the same capillary will be-

A. $6h$

B. $\frac{1}{6}h$

C. h

D. Zero

Answer: A

Watch Video Solution

166. Two capillary tubes of same diameter are put vertically one each in two liquids whose relative densities are 0.8 and 0.6 and surface tensions are 60 dyne/cm and 50 dyne/cm

respectively. Ratio of heights of liquids in the two tubes $\frac{h_1}{h_2}$ is

A. $\frac{10}{9}$

B. $\frac{3}{10}$

C. $\frac{10}{3}$

D. $\frac{9}{10}$

Answer: D

Watch Video Solution

167. Water rises in a capillary tube to a height 2.0 cm. In an another capillary tube whose radius is one third of it, how much the water will rise ? If the first capillary tube is inclined at an angle of 60° with the vertical then what will be the position of water in the tube.

A. $2.0cm$

B. $4.0cm$

C. $\frac{4}{\sqrt{3}}cm$

D. $2\sqrt{2}cm$

Answer: B

Watch Video Solution

168. 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. $\frac{hr\rho g}{2}$

Answer: D

Watch Video Solution

169. In a capillary tube experiment, a vertical 30 cm long capillary tube is dipped in water. The water rises up to a height of 10 cm due to capillary action. If this experiment is conducted in a freely falling elevator, the length of te water column becomes

A. $10cm$

B. $20cm$

C. $30cm$

D. Zero

Answer: C

Watch Video Solution

170. Radius of a capillary is $2 \times 10^{-3}m$. A liquid of weight $6.28 \times 10^{-4}N$ may remain in the capillary, then the surface tension of liquid will be:

A. $5 \times 10^{-3} N/m$

B. $5 \times 10^{-2} N/m$

C. $5N/m$

D. $50N/m$

Answer: B

Watch Video Solution

171. Two long capillary tubes A and B of radius $R_B > R_A$ dipped in same liquid. Then

A. Water rise is more in A than B

B. Water rises more in B than A

C. Same water rise in both

D. All of these according to the density of water

Answer: A

Watch Video Solution

172. If water rises in a capillary tube upto 3 cm . What is the diameter of capillary tube (Surface tension of water $= 7.2 \times 10^{-2} N/m$)

A. $9.6 \times 10^{-4} m$

B. $9.6 \times 10^{-3} m$

C. $9.6 \times 10^{-2} m$

D. $9.6 \times 10^{-1} m$

Answer: A

Watch Video Solution

Watch Video Solution

173. When a capillary is dipped in water, water rises 0.015 m in it. If the surface tension of water is $75 \times 10^{-3} N/m$, the radius of capillary is

A. $0.1mm$

B. $0.5mm$

C. $1mm$

D. $2mm$

Answer: C

Watch Video Solution

174. In a capillary tube, water rises to 3 mm . The height of water that will rise in another capillary tube having one-third radius of the first is

A. $1mm$

B. $3mm$

C. $6mm$

D. $9mm$

Answer: D

Watch Video Solution

175. Kerosene oil rises up the wick in a lantern

A. Due to surface tension of the oil

B. The wick attracts the kerosene oil

C. Of the diffusion of the oil through the wick

D. None of the above

Answer: A

 Watch Video Solution

176. Water rises against gravity in a capillary tube when its one end is dipped into water because

A. Pressure below the meniscus is less than atmospheric pressure

B. Pressure below the meniscus is more than atmospheric pressure

C. Capillary attracts water

D. Of viscosity

Answer: A

Watch Video Solution

177. A capillary tube of radius R is immersed in water and water rises in it to a height H . Mass of water in the capillary tube is . M If the

radius of the tube is doubled, mass of water that will rise in the capillary tube will now be

A. M

B. $2M$

C. $M/2$

D. $4M$

Answer: B

Watch Video Solution

178. Water rises up to a height h in a capillary tube of certain diameter. This capillary tube is replaced by a similar tube of half the diameter. Now the water will rise to the height of

A. 4h

B. 3h

C. 2h

D. h

Answer: C

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179. There is a howizontal 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?

A. $\pi R^2 / T$

B. $\pi R^2 T$

C. $2\pi RT$

D. $2RT$

Answer: D

Watch Video Solution

180. If a number of little droplets of water, each of radius r, coalesce to form a single drop of radius R, show that the rise in temperature will be given by $\frac{3T}{J}\left(\frac{1}{r}-\frac{1}{R}\right)$ where T is the surface tension of water and J is the mechanical equivalent of heat.

A. $\frac{2T}{rJ}$

B. $\frac{3T}{RJ}$

C. $\frac{3T}{J}\left(\frac{1}{r}-\frac{1}{R}\right)$

D. $\frac{2T}{J}\left(\frac{1}{r}-\frac{1}{R}\right)$

Answer: C

Watch Video Solution

181. An air bubble in a water tank rises from the bottom to the top. Which of the following statements are true?

A. Bubble rises upwards because pressure at the bottom is less than that at the top.

B. Bubble rises upwards because pressure at the bottom is greater than that at the top.

C. As the bubble rises, its size increases

D. As the bubble rises, its size decreases

Answer: B::C

Watch Video Solution

182. In a surface tension experiment with a capillary tube water rises upto $0.1m$. If the same experiment is repeated in an artificial satellite, which is revolving around the earth, water will rise in the capillary tube upto a height of

A. $0.1m$

B. $0.2m$

C. $0.98m$

D. Full length of the capillary tube

Answer: D

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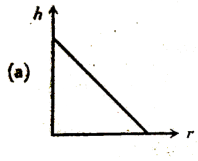
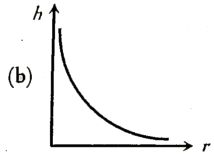
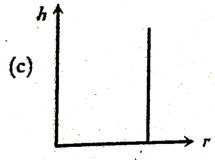
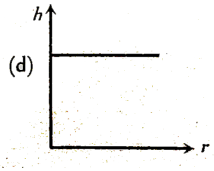
183. The correct curve between the height or depression h of liquid in a capillary tube and its radius is

A. 

B. 

C. 

D. 

Answer: B

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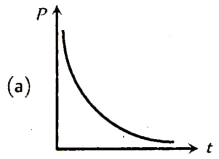
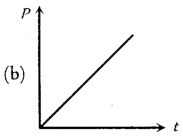
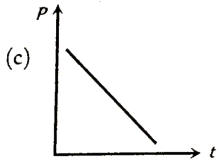
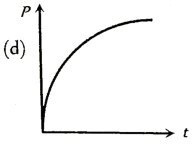
184. A soap bubble is blown with the help of mechanical pump at the mouth of a tube. The pump produces a cartain increase per minute in the volume of the bubble, irrespective of its internal pressure. The graph between the pressure inside the soap bubble and time t will be

A. 

B. 

C. 

D. 

Answer: A

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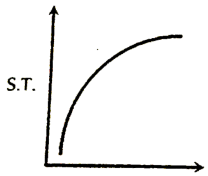
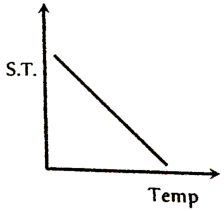
185. Which graph represents the variation of surface tension with temperature over small temperature ranges for water?

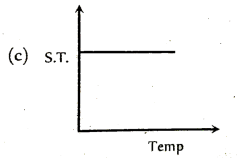
A.



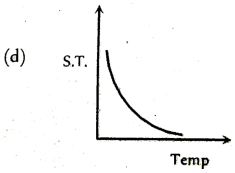
B.



C.



D.



Answer: B

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186. It becomes easier to spray the water in which some soap is dissolved. Why?

A. If both assertion and reason are true and the reason is the correct explanation of the assertion.

B. If both assertion and reason are true but reason is not the correct explanation of the assertion.

C. If assertion is true but reason is false

D. If the assertion and reason both are false

Answer: C

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187. Statement-1: It is better to wash the clothes in cold soap solution.

Statement-2: The surface tension of cold solution is more than the surface tension of hot solution:

A. If both assertion and reason are true and the reason is the correct explanation of the assertion.

B. If both assertion and reason are true but reason is not the correct explanation of the assertion.

C. If assertion is true but reason is false

D. If assertion is false but reason is true.

Answer: D

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188. In the following questions, a statement of assertion is followed by a statement of reason. Mark the correct choice as

(a) If both assertion and reason are true and reason is the correct explanation of assertion.

(b) If both assertion and reason are true but reason is not the correct explanation of assertion.

(c) If assertion is true but reason is false.

(d) If assertion and reason are false.

Q. Assertion: When height of a tube is less

than liquid rise in the capillary tube, the liquid does not overflow.

Reason: Product of radius of meniscus and height of liquid in capullary tube always remains constant.

A. If both assertion and reason are true and the reason is the correct explanation of the assertion.

B. If both assertion and reason are true but reason is not the correct explanation of the assertion.

C. If assertion is true but reason is false

D. If the assertion and reason both are false

Answer: A

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189. In the following questions, a statement of assertion is followed by a statement of reason. Mark the correct choice as

(a) If both assertion and reason are true and

reason is the correct explanation of assertion.

(b) If both assertion and reason are true but reason is not the correct explanation of assertion.

(c) If assertion is true but reason is false.

(d) If assertion and reason are false.

Q. A needle placed carefully on the surface of water may float, whereas a ball of the same material will always sink.

Reason: The buoyancy of an object depends both on the material and shape of the object.

A. If both assertion and reason are true and the reason is the correct explanation of the assertion.

B. If both assertion and reason are true but reason is not the correct explanation of the assertion.

C. If assertion is true but reason is false

D. If the assertion and reason both are false

Answer: C

Watch Video Solution

190. In the following questions, a statement of assertion is followed by a statement of reason. Mark the correct choice as

(a) If both assertion and reason are true and reason is the correct explanation of assertion.

(b) If both assertion and reason are true but reason is not the correct explanation of assertion.

(c) If assertion is true but reason is false.

(d) If assertion and reason are false.

Q. Assertion: A large force is required to draw apart normally two glass plates enclosing a thin water film.

Reason: Water works as glue and sticks two glass plates.

A. If both assertion and reason are true and the reason is the correct explanation of the assertion.

B. If both assertion and reason are true but reason is not the correct explanation of the assertion.

C. If assertion is true but reason is false

D. If the assertion and reason both are false

Answer: C

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191. Assertion : The impurities always decrease the surface tension of a liquid.

Reason : The change in surface tension of the

liquid depends upon the degree of contamination of the impurity.

A. If both assertion and reason are true and the reason is the correct explanation of the assertion.

B. If both assertion and reason are true but reason is not the correct explanation of the assertion.

C. If assertion is true but reason is false

D. If assertion is false but reason is true.

Answer: D

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192. Statement-1: The angle of contact of a liquid decrease with increase in temeperature

Statement-2: With increase in temperature the surface tension of liquid increase.

A. If both assertion and reason are true and the reason is the correct explanation of the assertion.

B. If both assertion and reason are true but reason is not the correct explanation of the assertion.

C. If assertion is true but reason is false

D. If the assertion and reason both are false

Answer: C

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193. Assertion : The concept of surface tension is held only for liquids.

Reason : Surface tension does not hold for gases.

A. If both assertion and reason are true and the reason is the correct explanation of the assertion.

B. If both assertion and reason are true but reason is not the correct explanation of the assertion.

C. If assertion is true but reason is false

D. If the assertion and reason both are false

Answer: B

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194. In the following questions, a statement of assertion is followed by a statement of reason. Mark the correct choice as

(a) If both assertion and reason are true and

reason is the correct explanation of assertion.

(b) If both assertion and reason are true but reason is not the correct explanation of assertion.

(c) If assertion is true but reason is false.

(d) If assertion and reason are false.

Q. Assertion: At critical temperature, surface tension of a liquid becomes zero. ltbr. Reason: At this temperature intermolecular forces for liquids and gases become equal. Liquid can expand without any restriction.

A. If both assertion and reason are true and the reason is the correct explanation of the assertion.

B. If both assertion and reason are true but reason is not the correct explanation of the assertion.

C. If assertion is true but reason is false

D. If the assertion and reason both are false

Answer: A

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195. In the following questions, a statement of assertion is followed by a statement of reason. Mark the correct choice as

(a) If both assertion and reason are true and reason is the correct explanation of assertion.

(b) If both assertion and reason are true but reason is not the correct explanation of assertion.

(c) If assertion is true but reason is false.

(d) If assertion and reason are false.

Q. Assertion: A large soap bubble expands while a small bubble shrinks, when they are connected to each other by a capillary tube.

Reason: The excess pressure inside bubble (or drop) is inversely proportional to the radius.

A. If both assertion and reason are true and the reason is the correct explanation of the assertion.

B. If both assertion and reason are true but reason is not the correct explanation of the assertion.

C. If assertion is true but reason is false

D. If the assertion and reason both are false

Answer: A

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196. Statement I: Smaller drops of liquid resist deforming forces better than the larger drops. Statement II: Excess pressure inside a drop is directly proportional to its surface area.

A. If both assertion and reason are true and the reason is the correct explanation of the assertion.

B. If both assertion and reason are true but reason is not the correct explanation of the assertion.

C. If assertion is true but reason is false

D. If the assertion and reason both are false

Answer: B

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197. Assertion : The water rises higher in a capillary tube of small diameter than in the capillary tube of large diameter.

Reason : Height through which liquid rises in a capillary tube is inversely proportional to the diameter of the capillary tube.

A. If both assertion and reason are true and the reason is the correct explanation of the assertion.

B. If both assertion and reason are true but reason is not the correct explanation of the assertion.

C. If assertion is true but reason is false

D. If the assertion and reason both are false

Answer: A

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198. Statement-1: hot soup tastes better than the cold soup.

Statement-2: Hot soup spread properly on our tongue due to lower surface tension.

A. If both assertion and reason are true and the reason is the correct explanation of the assertion.

B. If both assertion and reason are true but reason is not the correct explanation of the assertion.

C. If assertion is true but reason is false

D. If the assertion and reason both are false

Answer: C

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199. Assertion : The shape of a liquid drop is spherical.

Reason : The pressure inside the drop is greater than that of outside.

A. If both assertion and reason are true and the reason is the correct explanation of the assertion.

B. If both assertion and reason are true but reason is not the correct explanation of the assertion.

C. If assertion is true but reason is false

D. If the assertion and reason both are false

Answer: B

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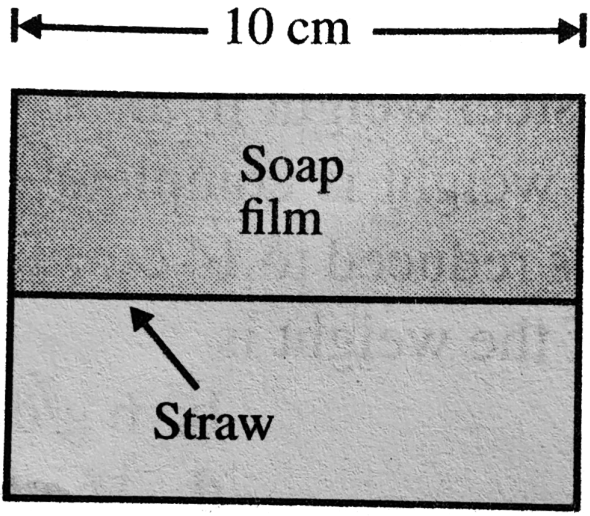
200. A soap film of surface tension $3 \times 10^{-2} N/m$ formed in a rectangular frame can support a straw as shown in Fig. If $g = 10 ms^{-2}$, the mass of the straw is



A. $0.06gm$

B. $0.6gm$

C. $6gm$

D. $60gm$

Answer: B

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201. Energy required to form a soap bubble of diameter 20 cm will be (Surface tension for soap solution is 30 dynes/cm)

A. $12000\pi ergs$

B. $1200\pi ergs$

C. $2400\pi ergs$

D. $24000\pi ergs$

Answer: D

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202. The work done in blowing a soap bubble of volume V is W. The work done in blowing a soap bubble of volume $2V$ is

A. $W/2$

B. $\sqrt{2}W$

C. $3\sqrt{2}W$

D. $3\sqrt{4}W$

Answer: D

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203. Surface tension of soap solution is $2 \times 10^{-2} N/m$. The work done in producing a soap bubble of radius 2 cm is

A. $64\pi \times 10^{-6} J$

B. $32\pi \times 10^{-6} J$

C. $16\pi \times 10^{-6} J$

D. $8\pi \times 10^{-6} J$

Answer: A

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204. The execc pressure inside the first soap bubble is three times that inside the second

bubble. Then the ratio of the volumes of the first and second bubbles is

A. $1:3$

B. $1:9$

C. $1:27$

D. $1:81$

Answer: C

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205. When a capillary tube is dipped in water, water rises upto $8cm$ in the tube. What happends when the tube is pushed down such that its end is only $5cm$ above outside water level?

A. The radius of the meniscus increases and therefore water does not overflow

B. The radius of the meniscus decreases and therefore water does not overflow

C. The water forms a droplet on top of the tube but does not overflow

D. The water start overflowing

Answer: A

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206. A bubble of 8 mm diameter is formed in the air. The surface tension of soap solution is 30 dynes/cm . The excess pressure inside the bubble is

A. 150 dynes/cm

B. 300 dynes/cm

C. $3 \times 10^{-3} \text{dynes} / cm$

D. 12 dynes/cm

Answer: B

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207. The height upto which water will rise in a capillary tube will be:

A. Maximum when water temperature is $4^\circ C$

B. Maximum when water temperature is $0^\circ C$

C. Minimum when water temperature is $4^\circ C$

D. Same at all temperatures

Answer: C

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

A. $1:0.15$

B. $1:3$

C. $1:6$

D. $1.5:1$

Answer: C

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209. The angle of contact between glass and water is 0° and surface tension is $70 dyn/cm$. Water rises in a glass capillary up to $6cm$. Another liquid of surface tension $140 dyn/cm$, angle of contact 60° and relative density 2 will rise in the same capillary up to

A. $12cm$

B. $24cm$

C. $3cm$

D. $6cm$

Answer: C

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210. A drop of water breaks into two droplets of equal size. In this process which of the following statements is correct?

(1). The sum of temperature of the two

droplets together is equal to the original temperature of the drop.

(2).the sum of masses of the two droplets is equal to the original mass of the drop.

(3). the sum of the radii of the two droplets is equal to the radius of the original drop.

(4). the sum of the surface areas of the two droplets is equal to the surface area of the original drop.

A. The sum of temperature of the two droplets together is equal to the original temperature of the drop

B. The sum of masses of the two droplets is equal to the original mass of the drop

C. The sum of the radii of two droplets is equal to the radius of the original drop

D. The sum of the surface areas of the two droplets is equal to the surface area of the original drop

Answer: B

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

A. Double

B. Slightly less than double

C. Slightly less than four times

D. Slightly more than four times

Answer: C

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212. A false statement is

A. Angle of contact $\theta < 90^\circ$, if cohesive force $<$ adhesive force

B. Angle of contact $\theta > 90^\circ$, if cohesive force $>$ adhesive force

C. Angle of contact $\theta = 90^\circ$, if cohesive force = adhesive force

D. If the radius of capillary is reduced to half, the rise of liquid column becomes four times

Answer: D

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213. 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

A. $1.44 \times 10^4 \text{dyne} - cm^{-2}$

B. $1.44 \times 10^4 \text{newton} - m^{-2}$

C. $1.44 \times 10^3 \text{dyne} - cm^{-2}$

D. $1.44 \times 10^5 \text{newton} - m^{-2}$

Answer: A

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214. Water rises to a height of 16.3 cm in a capillary of height 18 cm above the water leve. If the tube is cut at a height of 12 cm -

A. Water will come as a fountain from the capillary tube

B. Water will stay at a height of 12 cm in the capillary tube

C. The height of the water in the capillary will be 10.3 cm

D. Water will flow down the sides of the capillary tube

Answer: B

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