

**TOPIC :- MECHANICAL PROPERTIES OF FLUID****CASE STUDY-1****SURFACE TENSION**

**Read the following paragraph and answer the questions that follows:**

The property due to which the free surface of liquid tends to have minimum surface area and behaves like a stretched membrane is called surface tension. It is a force per unit length acting in the plane of interface between the liquid and the bounding surface *i.e.*,  $S = F/L$ , where  $F$  = force acting on either side of imaginary line on surface and  $L$  = length of imaginary line. Surface tension decreases with rise in temperature. Highly soluble impurities increases surface tension and sparingly soluble impurities decreases surface tension.

1. Which of the following statements is not true about surface tension?

- (a) A small liquid drop takes spherical shape due to surface tension.
- (b) Surface tension is a vector quantity.
- (c) Surface tension of liquid is a molecular phenomenon.
- (d) Surface tension of liquid depends on length but not on the area.

**Answer: (b)** Surface tension is a vector quantity.

2. A liquid does not wet the solid surface if the angle of contact is \*

- (a)  $0^\circ$
- (b) equal to  $45^\circ$
- (c) equal to  $90^\circ$
- (d) greater than  $90^\circ$

**Answer: (d)** greater than  $90^\circ$

3. The excess pressure inside a soap bubble is three times than excess pressure inside a second soap bubble, then the ratio of their surface area is \*

- (a) 9 : 1
- (b) 1 : 3
- (c) 1 : 9

(d) 3 : 1

**Answer: (c) 1 : 9**

4. The angle of contact at the interface of liquid-glass is greater than 90 degree. It can be concluded that \*

(a) Force of cohesion among liquid molecule is negligible as compared to force of adhesion between liquid and glass molecule.

(b) Force of cohesion among liquid molecule is greater than the force of adhesion between liquid and glass molecule.

(c) Force of adhesion is greater than force of cohesion.

(d) None of these

**Answer: (b)** Force of cohesion among liquid molecule is greater than the force of adhesion between liquid and glass molecule

5. **Assertion-Reasoning Question:** \*

**Assertion :** The angle of contact of a liquid with a solid decreases with increase in temperature.

**Reason :** With increase in temperature, the surface tension of the liquid increases.

(A) Both A and R are true and R is the correct explanation of A.

(B) Both A and R are true but R is not the correct explanation of A.

(C) A is true but R is false.

(D) A is false and R is also false.

**Answer: (c)** A is true but R is false

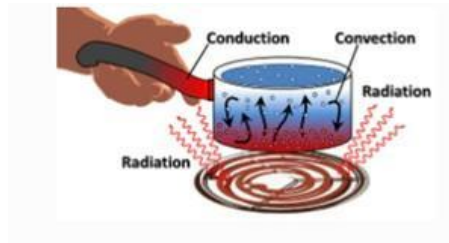
## TOPIC :- THERMAL PROPERTIES OF MATTER

### CASE STUDY - 2

#### MODES OF TRANSFER OF HEAT

**Read the following paragraph and answer the questions that follows:**

The figure shows the different modes of transfer of heat, heat transfer is defined as the movement of heat across the border of the system due to a difference in temperature between the system and its surroundings. The temperature difference exists between the two systems, heat will find a way to transfer from the higher to the lower system. Heat absorbed or given off by the object depends upon its specific heat capacity. Specific heat capacity is the amount of heat absorbed or given off to change the temperature of unit mass of it by one unit. If the amount of substance is specified in terms of moles, then it is known as molar specific heat capacity.



6. The sea breeze is caused by: \*

- (a) conduction
- (b) convection
- (c) radiation
- (d) none of these

**Answer: (b)** convection

7. The most appropriate material for a cooking pot is the one having \*

- (a) high specific heat and low conductivity
- (b) high specific heat and high conductivity
- (c) low specific heat and low conductivity
- (d) low specific heat and high conductivity

**Answer: (a)** high specific heat and low conductivity

8. The specific heat capacities (J per kg per K) of water and edible oil are given as 4186 and 1965 respectively. Chose the correct answer from the options given below. \*

- (a) Edible oil can be used as a better coolant in automobile radiators
- (b) Water can be used as a better coolant in automobile radiators
- (c) Both Water and edible oil give same performance as coolants
- (d) None of the above

**Answer: (b)** Water can be used as a better coolant in automobile radiators

9. Consider four sealed bottles with tightly screwed lids (as shown in fig) made up of Aluminum, Brass, Iron and copper. The given metals can be arranged as Aluminum > Brass > Copper > Iron in terms of their co-efficient of linear expansion. If they are immersed in hot water of same temperature, which lid will get most loosened? \*



- (a) Copper
- (b) Brass
- (c) Iron
- (d) Aluminum

**Answer: (a) Copper**

10. **Assertion-Reasoning Question:**

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**Assertion :** All bodies emit radiant energy whether they are solid, liquid or gases.

**Reason :** Black bodies absorb and emit radiant energy better than bodies of lighter colours.

- (A) Both A and R are true and R is the correct explanation of A.
- (B) Both A and R are true but R is not the correct explanation of A.
- (C) A is true but R is false.
- (D) A is false and R is also false.

**Answer: (b) Both A and R are true but R is not the correct explanation of A.**

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