

Exercise Questions

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1. State similarities and differences between the laboratory thermometer and the clinical thermometer.

Solution:

Similarities

- Both are made of glass and consist of long narrow glass tube.
- At one end both of them have a bulb.
- Bulbs of both the thermometers consist of mercury
- Celsius scale is present in both the thermometer

Differences

Clinical Thermometer	Laboratory thermometer
Temperature range if 35 to 42 ⁰ c	Temperature range is -10 to 110 ⁰ c
Used to measure human body temperature	Used to measure temperature in the laboratory
It has kink which prevents immediate backflow of mercury	It does not have a kink

2. Give two examples each of conductors and insulators of heat.

Solution:

Conductors: Iron and Copper

Insulators: Plastic and wood

3.Fill in the blanks :

- The hotness of an object is determined by its _____.
- Temperature of boiling water cannot be measured by a _____ thermometer.
- Temperature is measured in degree _____.
- No medium is required for transfer of heat by the process of _____.
- A cold steel spoon is dipped in a cup of hot milk. Heat is transferred to its other end by the process of _____.
- Clothes of _____ colours absorb more heat better than clothes of light colours.

Solution:

- The hotness of an object is determined by its temperature.
- Temperature of boiling water cannot be measured by a clinical thermometer.
- Temperature is measured in degree Celcius.
- No medium is required for transfer of heat by the process of radiation.
- A cold steel spoon is dipped in a cup of hot milk. Heat is transferred to its other end by the process of conduction.
- Clothes of dark colours absorb more heat better than clothes of light colours.

4. Match the following : (d) night

Column-I	Column-II
(i) Land breeze blows during	(a) summer
(ii) Sea breeze blows during	(b) winter
(iii) Dark coloured clothes are preferred during	(c) day
(iv) Light coloured clothes are preferred during	(d) night

Solution:

Column-I	Column-II
(i) The land breeze blows during	(d) night
(ii) The sea breeze blows during	(c) day
(iii) Dark coloured clothes are preferred during	(b) winter
(iv) Light coloured clothes are preferred during	(a) summer

5. Discuss why wearing more layers of clothing during winter keeps us warmer than wearing just one thick piece of clothing.

Solution:

More layers of clothing during winter keeps us warmer than wearing just one thick piece of clothing because air gets trapped in-between layer. As air is a bad conductor of heat it does not allow the escape of the heat from the body.

6. Look at Fig. 4.13. Mark where the heat is being transferred by conduction, by convection and by radiation.



Solution:



7. In places of hot climate it is advised that the outer walls of houses be painted white. Explain.

Solution:

In places of hot climate, it is advised that the outer walls of houses be painted white because white colour reflects back most of the heat that is incident on it as white is a poor absorber of heat. This helps in keeping the house cool.

8. One litre of water at 30°C is mixed with one litre of water at 50°C . The temperature of the mixture will be

(a) 80°C (b) more than 50°C but less than 80°C (c) 20°C (d) between 30°C and 50°C

Solution:

The temperature of the mixture will be between 30°C and 50°C because hot water loses the heat and simultaneously cold water gains heat this keeps the temperature in between 30°C and 50°C .

9. An iron ball at 40°C is dropped in a mug containing water at 40°C . The heat will

- (a) flow from iron ball to water.**
- (b) not flow from iron ball to water or from water to iron ball.**
- (c) flow from water to iron ball.**
- (d) increase the temperature of both.**

Solution:

Answer is (b) not flow from iron ball to water or from water to iron ball because both of them have the same temperature of 40°C .

10. A wooden spoon is dipped in a cup of ice cream. Its other end

- (a) becomes cold by the process of conduction.**
- (b) becomes cold by the process of convection.**
- (c) becomes cold by the process of radiation.**
- (d) does not become cold.**

Solution:

The answer is (d) does not become cold because wood is a bad conductor of heat.

11. Stainless steel pans are usually provided with copper bottoms. The reason for this could be that

- (a) copper bottom makes the pan more durable.**
- (b) such pans appear colourful.**
- (c) copper is a better conductor of heat than stainless steel.**
- (d) copper is easier to clean than the stainless steel**

Solution:

The answer is (c) copper is a better conductor of heat than the stainless steel.