MULTIPLE-CHOICE QUESTIONS

1. A marble tile would feel cold as compared to a wooden tile on a winter morning because the marble tile

(a) is a better conductor of heat than the wooden tile.

(b) is polished, while the wooden tile is not polished.

(c) reflects more heat than the wooden tile.

(d) is a poor conductor of heat than the wooden tile.

Soln:

The answer is (a) is a better conductor of heat than the wooden tile.

2. A beggar wrapped himself with a few layers of newspaper on a cold winter night. This helped him to keep himself warm because

(a) friction between the layers of newspaper produces heat.

(b) air trapped between the layers of newspaper is a bad conductor of heat.

(c) newspaper is a conductor of heat.

(d) newspaper is at a higher temperature than the temperature of the surrounding.

Soln:

The answer is (b) air trapped between the layers of newspaper is a bad conductor of heat.

Explanation:

The heat from his body will not escape into the surroundings, and this will help him to keep his body warm.

3. Paheli and Boojho measured their body temperature. Paheli found her's to be 98.6 °F, and Boojho recorded 37°C. Which of the following statement is true?

(a) Paheli has a higher body temperature than Boojho.

(b) Paheli has a lower body temperature than Boojho.

(c) Both have a normal body temperature.

(d) Both are suffering from fever.

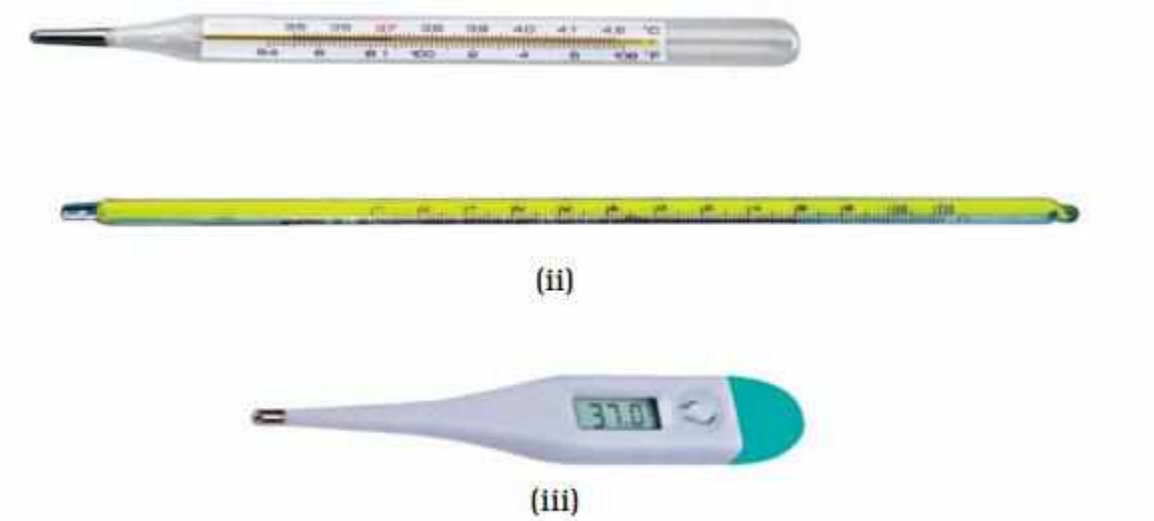
Soln:

The answer is (c) Both have normal body temperature.

Explanation:

Degree Celsius and Fahrenheit are two scales of temperature measurement. Normal body temperature is 37º which is equal to 98.6 F. Hence both of them have normal body temperature.

4. Boojho has three thermometers as shown in Figure 4.1. He wants to measure the temperature of his body and that of boiling water. Which thermometer (s) should he choose?



(ii)

(iii)

Fig. 4.1

(a) Thermometer (i) or (iii) for measuring body temperature and (ii) for measuring the temperature of boiling water.

(b) Thermometer (i) for measuring the temperature of both.

(c) Thermometer (ii) for measuring the temperature of both.

(d) Thermometer (iii) for measuring the temperature of both.

Soln:

The answer is (a) Thermometer (i) or (iii) for measuring body temperature and (ii) for measuring the temperature of boiling water.

Explanation:

Images 1 and 3 are of clinical thermometers used to measure body temperature and image 2 is of a laboratory thermometer, which is used to measure room temperature.

5. Four arrangements to measure the temperature of the ice in a beaker with laboratory thermometer are shown in Figure 4.2 (a, b, c and d). Which one of them shows the correct arrangement for accurate measurement of temperature?

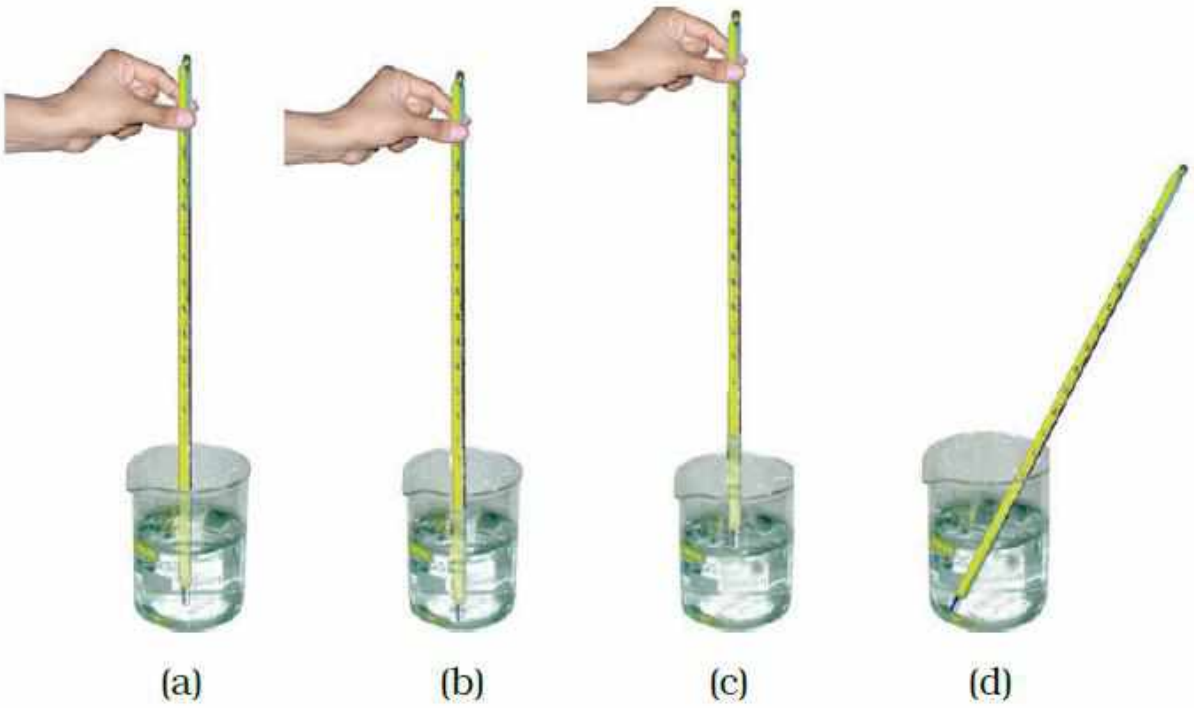


Fig. 4.2

Soln:

The answer is a)

6. Fig 4.3 (a–d) shows a student reading a doctor's thermometer. Which of the figure indicates the correct method of reading temperature?

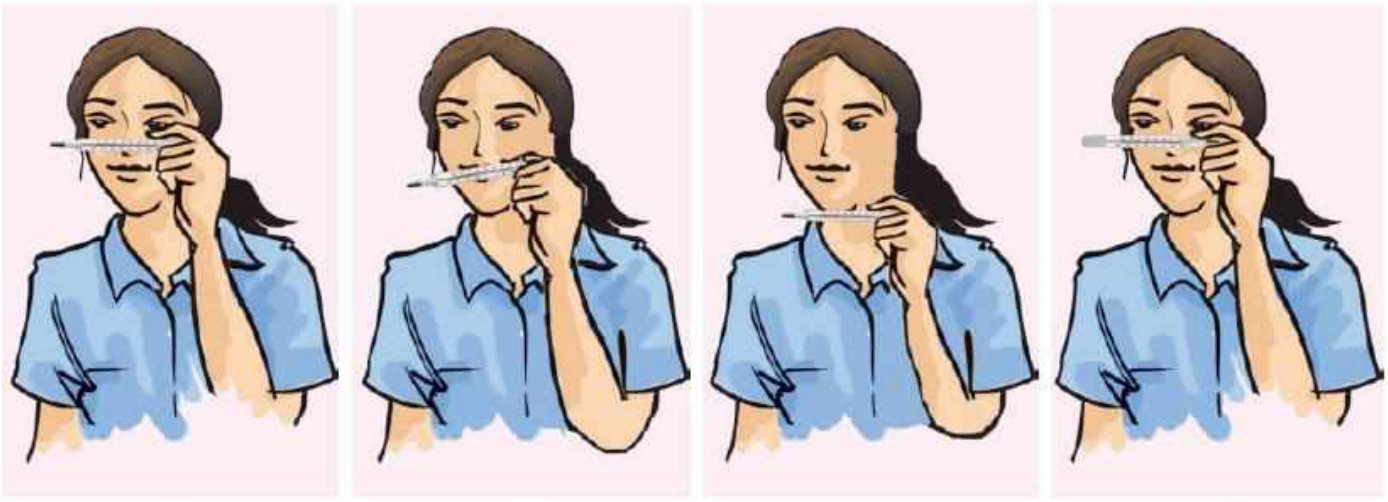


Fig. 4.3

Soln:

The answer is a)

7. Figure 4.4. (a–d) shows the readings on four different thermometers. Indicate which of the reading shows the normal human body temperature.

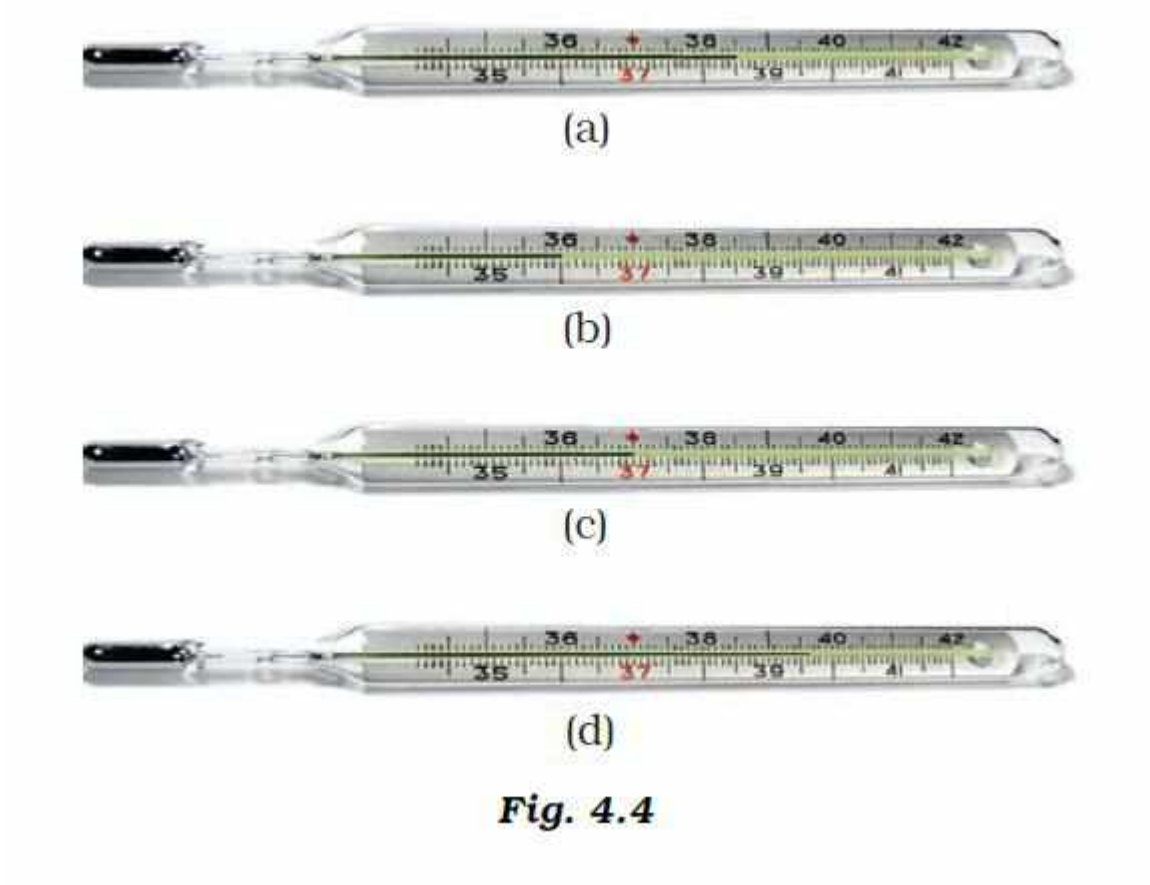


Fig. 4.4

Soln:

The answer is c)

Explanation:

Image c shows reading 37º c, which is human's body temperature hence the answer is c)

VERY SHORT ANSWER QUESTIONS

8. Shopkeepers selling ice blocks usually cover them with jute sacks. Explain why.

Soln:

Shopkeepers selling ice blocks usually cover them with jute sacks because materials like jute sacks sawdust and newspapers act as insulators and cannot allow escape or entry of heat through them.

9. A laboratory thermometer A is kept 7 cm away on the side of the flame while a similar thermometer B is kept 7 cm above the flame of a candle, as shown in Figure 4.5.

Fig. 4.5

Which of the thermometers, A or B, will show a greater rise in temperature? Give a reason for your answer.

Soln:

The answer is image b) because hot air rises up from candle which burns due to convection.

10. To keep her soup warm Paheli wrapped the container in which it was kept with a woollen cloth. Can she apply the same method to keep a glass of cold drink cool? Give a reason for your answer

Soln:

Yes, the woolen cloth can be used to keep a glass of cold drink cool because woollen is an insulator that will not allow escape or entry of heat.

11. In a mercury thermometer, the level of mercury rises when its bulb comes in contact with a hot object. What is the reason for this rise in the level of mercury?

Soln:

Mercury gets expanded on heating; hence its level rises in the capillary when it comes in contact with a hot object.

SHORT ANSWER QUESTIONS

12. A circular metal loop is heated at point O as shown in Figure 4.6.

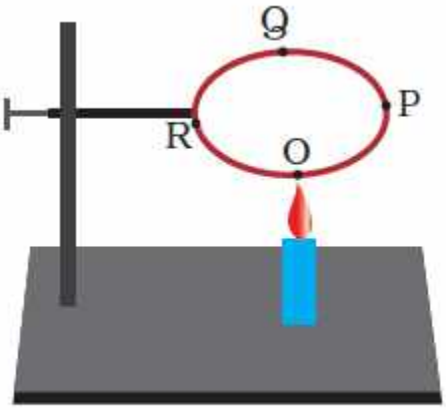


Fig. 4.6

1. **In which direction would heat flow in the loop?**

(ii) In which order the pins at points P,Q and R fixed with the help of wax fall if points O, P, Q and R are equidistant from each other?

Soln:

1. The heat will flow in both the directions, i.e. from O to P and O to R.
2. At first, the pins at R and P will fall simultaneously, followed by the pin at Q.

13. In the arrangements, A and B, shown in Figure 4.7, pins P and Q are fixed to a metal loop and an iron rod with the help of wax. In which case are both the pins likely to fall at different times? Explain.

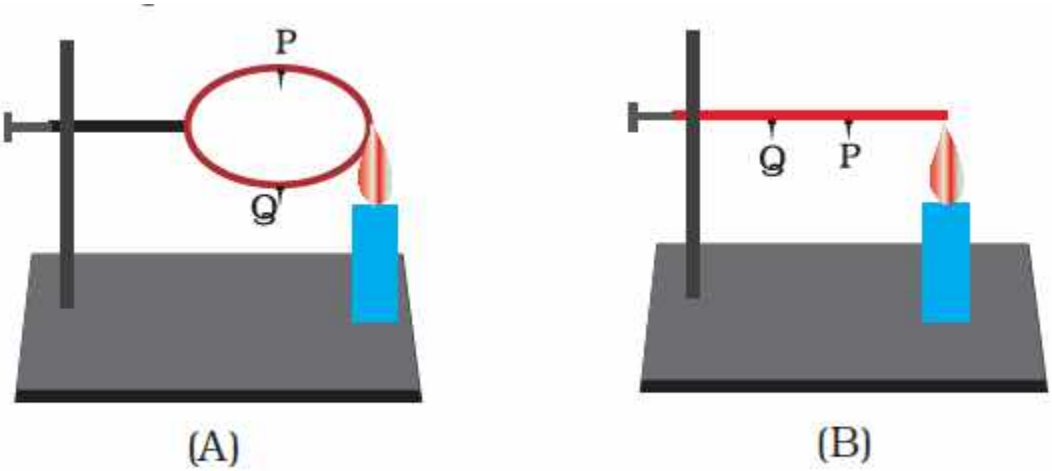


Fig. 4.7

Soln:

In case 'B' the pin P will fall before the pin Q because the heat will reach pin P first. In case 'A', the heat travels in both the directions and pins P and Q will fall simultaneously.

14. For setting curd, a small amount of curd is added to warm milk. The microbes present in the curd help in setting if the temperature of the mixture remains approximately between 35°C to 40°C. At places, where room temperature remains much below the range, the setting of curd becomes difficult. Suggest a way to set curd in such a situation.

Soln:

In order to maintain the desired temperature container with curd should be wrapped with woollen or any other insulator. Curd can also be set in a room with temperature below optimum by keeping the container near the gas stove.

15. You may have noticed that a few sharp jerks are given to clinical thermometer before using it. Why is it done so?

Soln:

The jerk will allow the mercury flow into the bulb above kink, which will make mercury level below normal temperature.

16. Why is it advised not to hold the thermometer by its bulb while reading it?

Soln:

If we hold the thermometer by its bulb while reading it, the mercury will get expanded by our body temperature.

17. At a campsite, there are tents of two shades – one made with black fabric and the other with white fabric. Which one will you prefer for resting on a hot summer afternoon? Give a reason for your choice. Would you like to prefer the same tent during winter?

Soln:

In summer I would choose a tent with white colour fabric as white is a bad absorber and a good reflector of Heat. But in winter I would choose a tent with black colour fabric as black is a good absorber and bad reflector of heat.

18. While constructing a house in a coastal area, in which direction should the windows preferably face and why?

Soln:

The windows of houses in coastal areas should preferably face towards the sea as sea breeze will keep it cool during day time.

19. Observe the picture given in Figure 4.8. Water is being boiled in a pan of wide base.

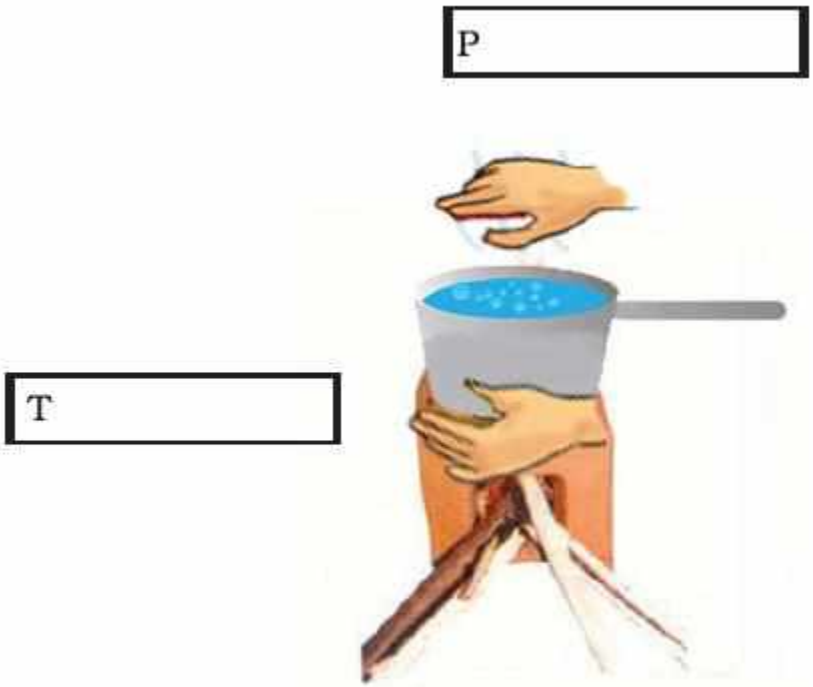


Fig. 4.8

1. **Which position P or T will feel warmer?**
2. **Fill up the boxes P and T to indicate the mode of flow of heat to the hand.**

Soln:

Position ‘P’ will feel warmer due to rising up of hot air.

P Convection

T Radiation

20. Look at Figure 4.9.

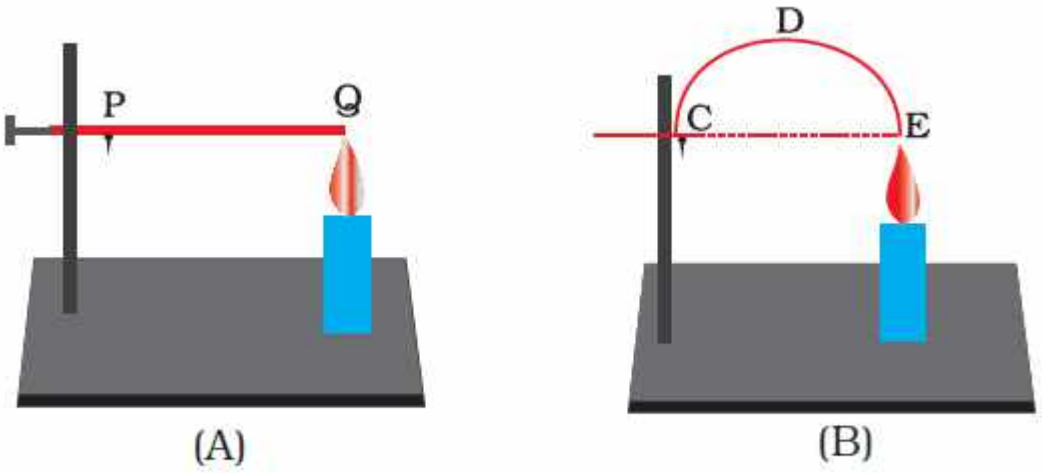


Fig. 4.9

The length of wire PQ in case of A is equal to the diameter of the semicircle formed by the wire CDE, in case B. One pin is attached to each wire with the help of wax as shown in Figure 4.9. Which pin will fall first? Explain.

Soln:

The pin on the wire in case A will fall first as heat will react to it before it reaches the pin in case B.