

## Heat

1. Which of the following conditions enables heat to flow from one body to another identical body?
  - (a) The difference in the temperatures of the two bodies
  - (b) The difference in the pressures exerted on the two bodies
  - (c) The difference in the densities of the two bodies
  - (d) The difference in the sizes of the two bodies
2. When you heat water in a pot, it boils. What can you infer from the above observation?
  - (a) Heat is a form of energy.
  - (b) Water can boil by itself.
  - (c) Water develops heat on its own.
  - (d) Water is a universal solvent.
3. What must be done to enable mercury in a glass thermometer to respond quickly to changes in temperature?
  - (a) The bore should be narrow.
  - (b) The wall of stem should be thin.
  - (c) The bulb should contain a lot of mercury.
  - (d) The wall of glass bulb should be thin.
4. Why do cooking vessels usually have copper bottoms?
  - (a) Copper has low melting point.
  - (b) Copper is an insulator of heat.
  - (c) Copper is a good conductor of heat.
  - (d) Copper is cheap.
5. For the effective radiation of heat by an electric room heater, which of the following needs to be done?
  - (a) Keep it clean.
  - (b) Polish it to shine.
  - (c) Paint it green.
  - (d) Paint it black.
6. What is the measure of the degree of hotness or coldness of a body called?
  - (a) Heat energy
  - (b) Celsius
  - (c) Kelvin
  - (d) Temperature
7. Why are two thin blankets piled together warmer than a single one of the same total thickness as the two?
  - (a) Air is enclosed in between them.
  - (b) The outer thin blanket transfers heat faster.
  - (c) Air acts as medium to transfer the energy.
  - (d) There is a decrease in the sensation of touch.
8. Conduction of heat does not take place in
  - (a) copper.
  - (b) iron.
  - (c) aluminium.
  - (d) vacuum.
9. Why are asbestos sheets used for laying the roofs of some houses?
  - (a) They are good conductors of heat.
  - (b) They are bad conductors of heat.
  - (c) They are costly.
  - (d) They have nice look.

- 10.** Why is mercury widely used in clinical thermometers?  
(i) Mercury is easily available in pure form.  
(ii) Mercury is opaque.  
(iii) Mercury has a constant coefficient of expansion.  
(a) Only (i) and (ii)  
(b) Only (ii) and (iii)  
(c) Only (i) and (iii)  
(d) (i), (ii) and (iii)
- 11.** Why is it hotter over the top of a fire than at the same distance on the sides?  
(a) Due to convection of heat  
(b) Due to conduction of heat  
(c) Due to radiation of heat  
(d) Due to conduction, convection and radiation of heat
- 12.** Which of the following is NOT a scale of temperature?  
(a) Kelvin scale  
(b) Celsius scale  
(c) Fahrenheit scale  
(d) Richter scale
- 13.** How many parts does a Celsius scale have?  
(a) 100  
(b) 273  
(c) 180  
(d) 50
- 14.** What is the range of a clinical thermometer?  
(a)  $0 - 100^{\circ}\text{C}$   
(b)  $32 - 214^{\circ}\text{F}$   
(c)  $0 - 273^{\circ}\text{C}$   
(d)  $35 - 42^{\circ}\text{C}$
- 15.** Identify the normal human body temperature.  
(a)  $32^{\circ}\text{F}$   
(b)  $212^{\circ}\text{F}$   
(c)  $100.4^{\circ}\text{F}$   
(d)  $98.4^{\circ}\text{F}$
- 16.** 'X' is the mode of transmission of heat that takes place by the movement of hot particles. Identify 'X'.  
(a) Conduction  
(b) Convection  
(c) Radiation  
(d) Expansion
- 17.** By which mode of transmission of heat does air get heated up?  
(a) Conduction  
(b) Convection  
(c) Radiation  
(d) Diffusion

- 18.** In cold countries, why are steam pipes covered with asbestos or glass wool?
- (a) To prevent bursting due to expansion
  - (b) To prevent heat loss due to conduction
  - (c) To prevent radiation
  - (d) All of the above
- 19.** Windows having double glass panes with some space between them is called double glazing. Why do windows in cold countries have double glazing?
- (a) For the conduction of heat
  - (b) For the insulation of heat
  - (c) For the radiation of heat
  - (d) All of the above
- 20.** Which of these phenomena is caused due to convection?
- (a) Ventilation
  - (b) Trade winds
  - (c) Ocean currents
  - (d) All of the above
- 21.** Which of the following is a good conductor of heat?
- (a) Plastic
  - (b) Water
  - (c) Glass
  - (d) Copper
- 22.** What is the mode by which heat is transferred in solid substances?
- (a) Conduction
  - (b) Convection
  - (c) Radiation
  - (d) Insulation
- 23.** Which of the following is a bad conductor of heat?
- (a) Wood
  - (b) Aluminium
  - (c) Iron
  - (d) Bronze
- 24.** When two objects are in thermal contact, how is the heat from one body to the other body transferred?
- (a) Conduction
  - (b) Convection
  - (c) Radiation
  - (d) Insulation
- 25.** How is heat conducted in solids?
- (a) From a high pressure to a low pressure region
  - (b) From a colder to a hotter region
  - (c) From a hotter to a colder region
  - (d) From a low pressure to a high pressure region
- 26.** Which is the best conductor of heat?
- (a) Silver
  - (b) Iron
  - (c) Aluminium
  - (d) Copper

- 27.** Why are tea cups never made of metals?  
(a) Metals are good conductors of heat.  
(b) Metals are lustrous.  
(c) Metals are expensive.  
(d) Metals have high melting point.
- 28.** In which of the following is the rate of heat transfer more?  
(a) Glass  
(b) Copper  
(c) Plastic  
(d) Wood
- 29.** Rooms are fitted with ventilators to let hot air out. What is the phenomenon involved in the above?  
(a) Conduction  
(b) Convection  
(c) Radiation  
(d) Condensation
- 30.** What enables birds to glide effortlessly in the air?  
(a) Conduction of heat in the air  
(b) Radiation through the atmosphere  
(c) Convection currents of air  
(d) More sugar in their body cells
- 31.** When we touch a steel rod and a sheet of paper simultaneously, why do we feel that the steel rod is colder than the sheet of paper?  
(a) Steel, being a good conductor, absorbs heat from our body.  
(b) Paper being a good conductor, absorbs more heat from our body.  
(c) Heat flows from steel to our body.  
(d) Heat flows from the paper to our body.
- 32.** What is the energy conversion taking place in an electric heater?  
(a) Chemical energy is converted to electrical energy.  
(b) Electrical energy is converted to chemical energy.  
(c) Heat energy is converted to electrical energy.  
(d) Electrical energy is converted to heat energy.
- 33.** Which of the following statements is true about convection?  
(a) In solids, heat is transferred only by convection.  
(b) Convection occurs in cold liquids.  
(c) Convection requires a medium for transmission.  
(d) Heat flows from the cold end to the hot end in a substance.
- 34.** Riaz needs a box which can absorb the heat from the sun very fast but lose it very slowly. How should the outer and the inner surface of the box be coloured so that he gets the best result?  
(a) Outer - Silver, Inner - Silver  
(b) Outer - Black, Inner - Black  
(c) Outer - Silver, Inner - Black  
(d) Outer - Black, Inner - Silver
- 35.** Which part of a thermos flask prevents loss of heat through radiation?  
(a) Vacuum (b) Cork stopper  
(c) Double glass walls (d) Shiny/silvery wall.

- 36.** A What happens when the temperature of a substance is increased?  
(a) Kinetic energy of the molecules of the substance increases.  
(b) Kinetic energy of the molecules of the substance decreases.  
(c) The amplitude of vibrations of molecules of the substance about their mean position decreases.  
(d) It does not cause any change.
- 37.** What is temperature?  
(a) The rate of expansion of an object  
(b) The loss of heat energy  
(c) The volume of a gas occupied  
(d) The degree of hotness or coldness of a body
- 38.** Why do solar panels have black surfaces?  
(a) Because they are good absorbers of heat  
(b) Because they are bad absorbers of heat  
(c) Because they are good reflectors of heat  
(d) Because they are bad radiators of heat
- 39.** There are four cups made of different materials: Silver, aluminium, wood and copper. In which of them will tea remain warm for a longer time?  
(a) Silver cup  
(b) Aluminium cup  
(c) Wooden cup  
(d) Copper cup
- 40.** The base of a cooking vessel is usually black and dull. Why is it made this way?  
(a) Black is a favorite color of most of the consumers.  
(b) Dull surface prevent slipping of vessels.  
(c) Black and dull surfaces are good absorbers of heat.  
(d) Black and dull surfaces are good reflectors of heat.

## Answers with Solutions

1. (a) When two identical bodies differ in their temperatures are in contact, heat flows from a body at a higher temperature to the other body at lower temperature.
2. (s) Boiling of water requires heat energy. Heat is a form of energy which makes the water particles move and heat up.
3. (d) Heat can be conducted quickly if the wall of glass bulb is thin in a mercury thermometer.
4. (c) Cooking vessels usually have copper bottoms because copper being a metal, is a good conductor of heat.
5. (b) Polished surfaces are good radiators of heat.
6. (d) The measure of degree of hotness or coldness of a body is called temperature.
7. (a) Air is trapped in between the two blankets. As air is a bad conductor of heat, the heat is retained inside the blanket, thus, preventing the cold air to enter inside it.
8. (d) Conduction of heat can take place only in a solid substance or in a material medium. So, it does not take place in vacuum.
9. (b) Asbestos sheets are used to lay the roofs of some houses because asbestos is a bad conductor of heat.
10. (d) Mercury is easily available in pure form and is opaque. Apart from that, mercury expands uniformly at all temperatures, hence it can help us to measure temperature accurately.
11. (a) Convection currents are higher on the top of the fire as compared to the sides. Thus, it is hotter at the top.
12. (d) Richter scale is used to measure the intensity of earthquakes.
13. (a) The difference between the lower fixed point and the upper fixed point is 100 parts on the celsius scale.
14. (d) A clinical thermometer is used to measure the body temperature and its range is between  $35^{\circ}\text{C}$  and  $42^{\circ}\text{C}$
15. (d) The normal body temperature of human beings is  $98.4^{\circ}\text{F}$ .

- 16.** (b) Convection is the mode of transfer of heat by the movement of particles.
- 17.** (b) Air or any other fluid gets heated up by convection.
- 18.** (b) In cold countries, steam pipes are covered with asbestos or glass wool (the most common modern day material). It prevents heat loss due to conduction.
- 19.** (b) In cold countries, windows have double glass panes with a small space between them. This space contains air which is a bad conductor of heat and prevents the dissipation of heat away from the room. This is called double glazing.
- 20.** (d) The phenomenon of convection causes ventilation. trade winds and ocean currents.
- 21.** (d) In general, metals are good conductors of heat and electricity, and copper is one among them.
- 22.** (a) In solids, heat is transferred from one point to another without the actual movement of the molecules from their position inside it i.e., by conduction.
- 23.** (a) Wood does not conduct heat or electricity.
- 24.** (a) When two bodies are in thermal contact, conduction of heat takes place.
- 25.** (c) In conduction, heat flows from the hotter to the colder region due to differences in temperature.
- 26.** (a) Silver is the best conductor of heat or electricity followed by copper.
- 27.** (a) Metals are good conductors of heat. Metal cups with hot liquids, would burn our hands, hence, they are not made of metals.
- 28.** (b) Copper is a metal and a good conductor of heat. So, the rate of heat transfer is more in it.
- 29.** (b) The phenomenon of convection is involved. Breathing by human beings increases the percentage of moisture and carbondioxide in air in the room. Moreover, the air gets warmer. The moist, warm air containing carbon dioxide becomes lighter, and hence, rises up.

This air then passes out through ventilators. This causes a drop in pressure within the room. Thus, the cold and fresh air from doors and windows flows in. This continuous circulation of air is maintained within the room by the phenomenon of convection.

- 30.** (c) The convection currents of air help birds glide effortlessly in the air.
- 31.** (a) Heat always flows from a hotter region to a colder one. Since, steel is a good conductor of heat, more heat will flow from our body into it and we will feel it as cold. As paper is a bad conductor, less heat will flow from our body.
- 32.** (d) Electrical energy is used by a heater to give out heat energy. This conversion uses the heating effects of electricity when it passes through substances.
- 33.** (c) In fluids, convection requires a medium.
- 34.** (d) The outer surface should be black as more heat from the sun should be absorbed. The inner surface should be coated with silver so that most of the heat is retained/ radiated into the box.
- 35.** (d) Though there is vacuum in the thermos flask, radiation can take place as it does not require a medium. The shiny, silvery wall reflects the radiated heat and thus keeps the contents hot/cold,
- 36.** (a) When the temperature of a substance is increased by heating, kinetic energy of the molecules of the substance increases.
- 37.** (d) The degree of hotness or coldness of a body is called temperature.
- 38.** (a) Solar panels have black surfaces to absorb heat from the sun and to store it as solar energy. Hence, a black and rough surface can facilitate this.
- 39.** (c) Wooden cup being a bad conductor of heat does not allow heat to radiate. So, tea remains warmer for a longer time in a wooden cup.
- 40.** (c) Black and dull surfaces are good absorbers of heat. Hence, cooking will be faster with minimum loss of heat.