9. Heat

Q. 1. Fill in the blanks with the proper word from the brackets.

(Radiation, White, Conduction, Blue, Convection, Bad conductor, Good conductor, Black, Reflection)

(i) Maximum heat is absorbed by a ..... coloured object.

Ans : Black

(ii) .....of heat does not require a medium.

Ans : Radiation

(iii) Conduction of heat takes place through a ..... substance.

Ans : Good conductor

(iv) The shining surface in a thermos flask decreases the outgoing heat by ..... .

Ans : Reflection

(v) Cooking utensils are made from metals due to their property of.....

Ans : Conduction

(vi) The earth receives heat from the sun by..... .

Ans : radiation

Q.2. What will absorb heat ?

Steel spoon, wooden board, glass vessel, iron griddle (tava), glass, wooden spoon, plastic plate, soil, water, wax

Ans : Steel spoon, Iron griddle (tava), water

Q.3. Write whether the following statements are true or false.

(i) Wood is a good conductor of heat.

Ans : False

(ii) Silver is a bad conductor of heat.

Ans : False

(iii) The medium is required for convection

Ans : True

(iv) An infra-red camera is used for watching movement of enemy at night.

Ans : True

(v) The medium is not required for radiation

Ans : True

(vi) White clothes are used in winter

Ans : False

(vii) Thermos flask are used for keeping cold drinks.

Ans : False

Q.4. Write answers to the following question.

(1) How does a fever get lowerd by putting a cold compress on the forehead of a patient ?

Ans : A cold compress absorbs heat from the patient's forehead, since water evaporates slowly from the cloth. So the body temperature gets lowered .

(2) Why are the houses in Rajastan painted white ?

Ans : In Rajasthan, there is a very high temperature in summer. White color reflects most of the sun's incident radiant heat . Also the absorption of heat by white color is very few so houses do not get heated up. Therefore, houses in Rajasthan are painted white.

(3) What are the modes of heat transfer ?

Ans : Thre are three modes of heat transfer (i) conduction (ii) convection (iii) radiation.

(4) Explain which mode of heat transfer causes sea breezes and land breezes.

Ans : During day time the land gets heated up by sun's radiant energy fastly than water in the sea. So hot atmospheric air over the land increases due to lower density and transfer of heat by

convection currents. Similarly cold air with higher density from the sea blows towards land which is called sea breeze. During night time the land mass cools quickly while sea remians warmer. Again warmer air above the sea increases due to convection and low density, so the winds blow from land to sea.

(5) Why is the outer coat of the penguins of Antarctica black?

Ans : In Antarctica there is freezing cold temperature. Black colour absorbs radiant heat energy from sun.Warm blooded animals struggle to keep their body warm. Penguins' outer black coat colour absorbs radiant heat from sun, that helps them to keep their body temperature warm.

(6) Why are hearters fitted near the floor and air conditioners, near the ceiling of a room ?

Ans : The density of air depends upon the tempreture. Due to the lower density,the air warmed by the heater near the floor rises up easily and due to higher density, the cold air near the ceiling comes down and replaces it. The density difference of air at upper and lower height sets in convection currents by transfer of heat. Similarly, due to higher density of air conditioners, it fitted near the ceiling blow cold air that settles down while warm air near the floor rises up due convection currents.

Q.5. Give scientific reasons.

(a) An ordinary glass bottle cracks when boiling water is poured into it, but a borosil glass bottle does not.

Ans : When boiling water is poured in ordinary glass bottle, the surface of hot water falls expands quickly. The heat is not conducted rapidly from this area. As compared to this part the adjacent part does not heat up and does not get expanded. Hence due to unequal expansion, there is a crack in the bottle. In borosil bottle, the heat conduction is very quick. The expansion due to heat is also uniform. Therefore borosil bottle does not crack.

(b) The telephone wires which sag in summer become straight in winter.

Ans: In summer, the surrounding temperature is high. Therefore, the wires of telephone expand and start sagging. In winter, the surrounding temperature is less and hence the wires contract and it become straight.

(c) Dew drops from on the grass, in winter .

Ans : The water holding capacity of the air depends upon the temperature. In winter, when the temperature is less, the water holding capacity also decreases. The excess moisture condenses on cool surface and the dew drops are formed.

(d) In winter, why does on iron pillar feel colder than a wooden pole ?

Ans : Iron is a good conductor of heat while wood is a bad conductor of heat. In winter, the temperature of body is more than the surrounding temperature. At that time, if we touch the iron pillar, there is a conduction of heat from our body to the iron pillar, Therefore we feel that iron pillar is cold. But when we touch a wooden pole, the conduction of heat does not take place and hence we do not feel that the wooden pole is cold.

(e) Ice is kept in sawdust to keep it from melting for a longer time.

Ans : (1) Sawdust is a bad conductor of heat. (2) So heat is not transferred through sawdust. Therefore, this prevents heat from reaching the ice. (3) Thus Ice is kept in sawdust, it does not melt. (4) Therefore, ice is kept in sawdust to keep it from melting for a longer time.

Q.6 Give the definition :

(1) Transfer of heat :

Ans : Transfer of heat means the flow of heat from one place to another.

(2) Conduction :

Ans : The transfer of heat from the hot part of an object to the cold part, is called conduction of heat.

(3) Convection :

Ans : The heat is transferred by means of currents, called convection currents .This process is called convection of heat.

(4) Radiation :

Ans : The transfer of heat that takes place without a medium is called radiation.

(5) Good conductor of heat :

Ans : Materials which allow heat to pass readily are called good conductors of heat. e.g. all metals

(6) Bad conductor of heat :

Ans : Bad conductor of heat are those materials that do not allow heat to pass through them e.g. plastic, wood.

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