ASSIGNMENTS
TUTORIAL
HEAT

Do you know, why?

1. The thick glass tumblers break when hot liquid is poured into them
   Ans: If boiling hot water is poured in a thick glass tumbler, it cracks because glass is a bad conductor of heat. Thus, the inner surface of tumbler expands more than the outer surface. Due to this uneven expansion, the glass cracks.
2. Gaps are left between rail joints to allow for expansion
   Ans: A small gap is kept at joints to allow for the expansion of tracks. If no gap is left for expansion or contraction, they will bend in summer. Thus, result in derailment of trains.
3. Slabs of ice are covered with sawdust or gunny bags
   Ans: The saw dust or gunny bags contain large amount of trapped air which acts as an insulator. So, it doesn't allow the heat from outside to reach ice.
4. If we walk barefoot on a stone floor,it appears to be very cold but if walk on a carpet in the same room it feels warmer.
   Ans: It is so because stone floor being a good conductor of heat, conducts away heat quickly from our feet. Our feet lose heat and make us feel cold. On the other hand, the carpet being a bad conductor of heat does not allow the heat of our feet to escape and hence feels warmer.
5. Solar cookers and solar water heaters are painted black from inside.
   Ans: This is because black surfaces are good absorber of heat.
6. Convection currents are produced inside the earth's crust.
   Ans: Molten rocks close to the earth's core are hottest. It rises towards the crust. Molten rocks closer to the earth's crust are cooler. It is heavier and sinks. This exchange of material between core and crust create convection currents which move huge pieces of earth's crust known as tectonic plates. The tectonic plates move close together or farther, forming mountains and trenches.

MODULE – 1

I. Fill in the blanks:

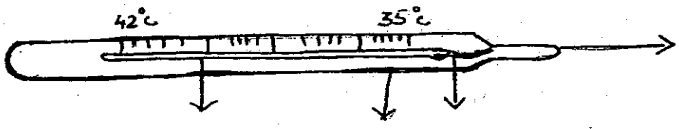
(i) The liquid used in thermometer usually is_____ .
(ii) Normal body temperature of a human is _____ °C &_____°F.
(iii) SI unit of heat is _____.

(iv) A reliable measure of the hotness of an object is its _____.

II. Correct the following statements:

(i) Clinical thermometer can measure temperature of all objects.
(ii) Clinical thermometer has 48°C as its upper limit.
(iii) Temperature is measured in calories.

III. Name the various parts of the clinical thermometer drawn in the figure and answer the given question.



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MODULE – 2

I. Fill in the blanks.

(i) In nuclear power plant, nuclear energy is first converted into _____energy and then into _____ energy.
(ii) The handle of a kettle is made up of a _____ conductor of heat.
(iii) Ice is usually covered with sawdust to prevent heat gain because sawdust is _____ conductor of heat.
(iv) Heat cannot flow from _____ body to _____ body.
(v) Conduction takes place in _____ only.
(vi) Fluffed up cotton & woollens are poor conductors of heat because of _____ present in them.

II. Correct the following statements

(i) The upper limit of laboratory thermometer is 60°C.
(ii) Laboratory thermometer has kink.
(iii) To read the temperature of an object, we take out the laboratory thermometer from it.
(iv) In conduction, heat is transferred from the colder end to the hotter end.

III. Which energy transformation takes place in following cases:-

(i) In thermal power station.
(ii) In electric bulb.
(iii) In steam engine.

(iv) In rubbing of palm together.

IV. Name the process involved in following activities –

(i) Heating of pan and then boiling of water in it.
(ii) Sea breeze and land breeze.
(iii) Circulation of air through ventilators.
(iv) Level of mercury rises when we keep clinical thermometer under our tongue.

V. Answer the following questions -

(i) At what temperature, Celsius & Fahrenheit scale shows equal values?
(ii) What are the values of freezing point & boiling point of water on Celsius scale?
(iii) Convert both the values in Fahrenheit.

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MODULE – 3 / 4

I. Fill in the blanks.

(i) Radiation of heat does not require any _____.
(ii) Dull black surfaces are _____ radiators and _____ heat absorbers.
(iii) Heat can not travel through convection in_____
(iv) Heat from the sun reaches us by the process of _____.
(v) In solid, heat is transferred by _____ while in liquid and gases heat is transferred by _____.

II. Select conductors and insulators from following –
Coin, air, paper, water, wood, iron, nail

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EXTRA QUESTIONS

I. Give reasons

(i) Clinical thermometer bulb explodes when placed under hot water.
(ii) If we hold clinical thermometer by its bulb, reading changes.

II. Write short answers for the following questions:

(i) Name two conditions that must be satisfied for the heat transfer by conduction.
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(ii) A spoon is dipped in to a cup of hot tea. Name the process by which the spoon absorbs the heat from the tea cup.

(iii) Why doesn't a clinical thermometer contain marking above 42°C?

III Answer the following questions -

(i) At what temperature Celsius & Fahrenheit scale shows equal values?

(ii) What are the values of freezing point & boiling point of water on Celsius scale?

(iii) Convert both the values in Fahrenheit.

IV Write short answers for the following questions:

(i) Give two points of difference between convection and radiation of heat.

(ii) How does a blanket keep us warm in winter?

(iii) Why do we feel hot when we stand near a fire?

(iv) Why do we prefer light coloured clothes in summers and dark coloured clothes in winters?

(v) Write any two examples which are based on convection current.

(vi) Several days after the end of a snowstorm, the roofs of a house gets completely covered with snow, another house has no snow on its roof. Which house is better insulated & why?

V. Give reasons :

(i) Ventilators are provided near the ceiling.

(ii) The bottom of cooking utensils are coloured black.

(iii) Cotton is used in quilts.

(iv) Thermocol is used to make ice boxes to carry ice.

(v) Radiators of cars & air conditioners are painted black.

VI. Draw the diagram for land breeze and sea breeze and answer the questions that follow:

(i) Why does land breeze occur during night-time?

(ii) Why does sea breeze occur during daytime?

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QUESTION BANK

I. Define:

(i) Heat

(ii) Temperature

(iii) Thermometer
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II. What are different scales for measuring temperature?

III. Relation between Celsius scale and Fahrenheit scale.

IV. Define least count of thermometer.

V. What is role of kink in a clinical thermometer?

VI. What precautions should be observed while using s clinical thermometer.

VII. State 2 similarities and 2 difference between clinical and laboratory thermometer.

VIII. Convert:

(i) 25°C to °F
(ii) 86°F to °C
(iii) 10°C to °F
(iv) 95°F to °C

IX. What are three methods of transfer of heat?

X. Define:

(i) Conduction
(ii) Conductors of heat
(iii) Insulators of heat

XI. Define:

(i) Convection
(ii) Sea breeze
(iii) Land breeze

XII. Define Radiation and give its examples.

XIII. Give reason:

(i) Slabs of ice are covered with sawdust or gunny bags.
(ii) Why are ventilators provided at high height and windows at low height?
(iii) Why are bottom surfaces of utensils made black?
(iv) Why do birds puff up their feathers in winters?
(v) Why wearing more layer of clothing during winter keeps us warmer than wearing just one piece of cloth.
(vi) In place of hot climate it is advised that the outer walls of houses be printed white. Why?

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