

2019

39. Boiling and evaporation are the two ways by which liquid water moves into the air as water vapour. Of the following statements connected with them, which is **false**?
- (1) Temperature remains constant during boiling as well as during evaporation.
 - (2) Boiling is a visible process while evaporation is an invisible process.
 - (3) Speed of wind affects evaporation but does not affect boiling.
 - (4) Temperature of water remains constant during boiling while decreases during evaporation.

2017

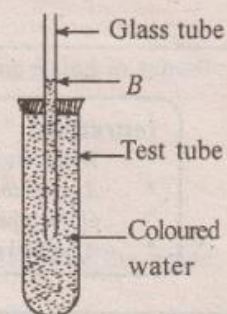
37. Test tube with the glass tube given in the figure is immersed in a vessel with water and heated for a small period of time.

Three statements regarding the observations of this experiment are given below.

X - The water level in the glass tube rises up gradually from *B* and stops.

Y - The water level in the glass tube drops down gradually from *B* and stops.

Z - The water level in the glass tube drops down from *B* and then rises up and exceeds the level *B*.



Of the above statements.

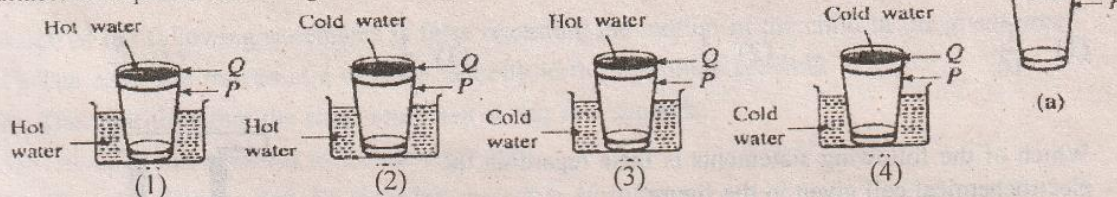
- (1) *X* is true.
- (2) *Y* is true.
- (3) *Z* is true
- (4) all *X*, *Y* and *Z* are false.

2016

15. On a certain day, in Nuwara Eliya town, the daytime temperature was 16°C and night-time temperature was 4°C . What is the temperature difference between day and night in Nuwara Eliya town on that day, in Kelvin?
- (1) 12 K
 - (2) 277 K
 - (3) 285 K
 - (4) 289 K

2016

25. As shown in the figure (a), the glass *Q* stick inside the glass *P*. Which of the following strategies is suitable to separate the two glasses easily?

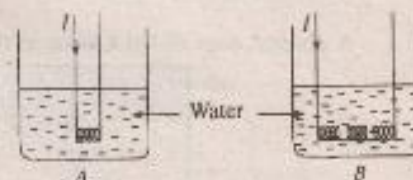


2015

25. The average temperature of the human body is 37°C . This temperature in the Kelvin scale is
- (1) 236 (2) 273 (3) 310 (4) 337

2015

36. Two similar beakers *A* and *B* contain similar volumes of water. One of four similar nichrome coils is immersed in beaker *A* and the other three coils connected in series are immersed in beaker *B* as shown in figures. The same current *I* is passed through the coils for the same period of time as shown in figures. If the increase in temperature of water in *A* and *B* are t_1 and t_2 respectively and there is no heat loss, which of the following is correct with regard to the temperatures?



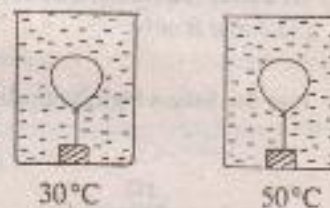
- (1) $t_2 = t_1$ (2) $t_2 = 2t_1$ (3) $t_2 = 3t_1$ (4) $t_2 = \frac{t_1}{3}$

2014

29. Select the correct statement from the following statements.
- (1) Heat capacity of a substance does not depend on its mass.
 - (2) The international unit of temperature is Fahrenheit.
 - (3) All non metals are non conductors of heat.
 - (4) Blackened pipes at the back of certain refrigerators remove heat by radiation.

2012

23. Two identical vessels are completely filled with water and one is maintained at 30°C while the other is maintained at 50°C . Two identical balloons with equal volumes of a gas were immersed in the vessels as shown in the diagram. Select the correct statement with regard to the volumes of water displaced from the beakers after a constant period of time.



- (1) A larger volume of water is displaced from the vessel at 50°C .
- (2) A larger volume of water is displaced from the vessel at 30°C .
- (3) Equal volumes of water get displaced from both vessels.
- (4) No adequate information has been provided to come to a conclusion.

2011

26. Equal quantities of heat are provided to two objects of equal masses made of substances of different specific heat capacities. Which of the following statements is correct with regard to the final temperature of those object?
- (1) The temperature of the object made of the substance with higher specific heat capacity is higher.
 - (2) The temperature of the object made of the substance with lower specific heat capacity is higher.
 - (3) The temperatures of both the objects are the same.
 - (4) Nothing can be stated without knowing the volumes of the objects.

2008

33. The table shows the temperature ranges, through which four thermometers are graduated. Which one out of these thermometers is most suited to be used for medical purposes?

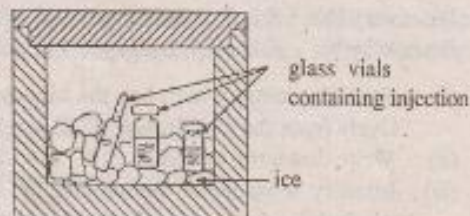
Thermometer	Minimum	Maximum
A	0°C	100 °C
B	-50°C	50 °C
C	-20°C	50 °C
D	30°C	40 °C

- (1) A (2) B (3) C (4) D

34. 500 ml each of liquid A and B, are contained in two identical vessels. Heat was supplied to these two vessels in a similar way and the time taken by the two liquids to raise the readings in the two thermometers by an equal value was greater for B than for A. Accordingly,
- (1) it can be concluded that the heat capacities of A and B are different.
 - (2) it can be concluded that the heat capacity of A is greater than that of B.
 - (3) it can be concluded that the heat capacity of B is greater than that of A.
 - (4) a definite conclusion cannot be made regarding the heat capacities of A and B.

2010

9. (A) Some types of injections have to be kept at a temperature below 5°C to keep their effectiveness constant. When glass vials containing injections, with pasted paper labels, have to be transported, they are packed in rigifoam boxes with pieces of ice as shown in the diagram.



- (i) Explain the reason for pieces of ice to remain without melting for a longer time when they are inside rigifoam boxes.
- (ii) Ice melts partially when transporting for a long time. State a practical problem which is likely to arise in such an instance.
- (iii) A special type of jelly, with a melting point below 0°C , is used to minimize such problems faced when packing among ice during transport. This jelly is filled in polythene packets, cooled to about 0°C in a refrigerator and placed in rigifoam boxes in place of ice.
 - (a) If the coolness in the box is to be retained for a longer time than when ice is used, what physical property of this jelly should be at a higher value?
 - (b) To retain the coolness for a longer time, an extra mass of jelly is added. In doing so, what physical property related to heat is increased?
- (iv) The rigifoam boxes are packed inside a big iron box when transporting. A coolness is felt when touching the iron box, but the same is not felt when touching the rigifoam boxes although both are at the same temperature. Explain this observation scientifically.

2012-B

(B) A and B are two aluminium vessels and C and D are two styrofoam (rigifoam) vessels similar to them. Added into those vessels are equal volumes of water at 30°C. The vessels are closed with wooden lids each fixed with a thermometer. The outer surfaces of them are painted as indicated in the table. The vessels were kept in an open place so that they all received sunlight equally. When the temperature of A had risen to 35°C, the temperatures of other vessels T_B , T_C , and T_D were read and recorded.

Vessel	Substance made up of	Colour of the outer surface	Final temperature/°C.
A	aluminium	white	35
B	aluminium	black	T_B
C	styrofoam	white	T_C
D	styrofoam	black	T_D

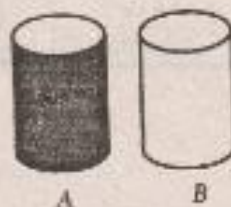
- (i) (a) Of the vessels A and B, which shows the highest temperature?
(b) Give reasons for your conclusion.
- (ii) In vessels C and D, the temperature didn't rise considerably during the time of the experiment. Explain the reason for this observation.

2015

10. The Sun emits light and heat in all directions.

- (i) (a) By which method of heat transfer, does the heat from Sun reach the Earth?
(b) How does the method you have mentioned in (a) above differ from the other heat transferring methods?
- (ii) On a hot sunny day, Sujith came home after school by walking on a tarred road.

- (a) When Sujith was walking along the road he saw there appeared to be a pool of water at the far end of the road. Explain briefly the phenomenon seen by him.
- (b) The roof of Sujith's house is sheltered with 40 asbestos sheets of 30 kg each. Due to the sun shine the temperature of the sheets increased from 35 °C to 40 °C. (Specific heat capacity of asbestos is $1\,050\text{ J Kg}^{-1}\text{ K}^{-1}$)
- Calculate the solar heat absorbed by one asbestos sheet.
 - Calculate the total amount of solar heat absorbed by all the sheets.
- (c) Sujith has activated a 0.1 kW electric fan for $\frac{1}{2}$ an hour since the house was warm. Calculate the electrical energy consumed by the electric fan.
- (d) There were equal volumes of water in two equal cylindrical metal tanks *A* and *B* kept outside the house under the sun. The outer surface of tank *A* was painted with black paint and the outer surface of tank *B* was shiny.
- Out of the two tanks, if Sujith wanted to have a bath with lesser warm water, which tank should be select?
 - Explain briefly the reason for the water in the two tanks to have different temperatures.



2016 7

- (B) Two similar arrangements, *X* and *Y* which have been used in a house to heat water using the voltage of 230 V are given below. However in *Y*, the immersion coil is immersed to a greater depth.
- When the immersion heaters are connected to the voltage supply, in which arrangement is the water heated upto the required temperature in a lesser time?
 - Briefly explain, the reason why the water in one vessel is heated quicker than the other.

