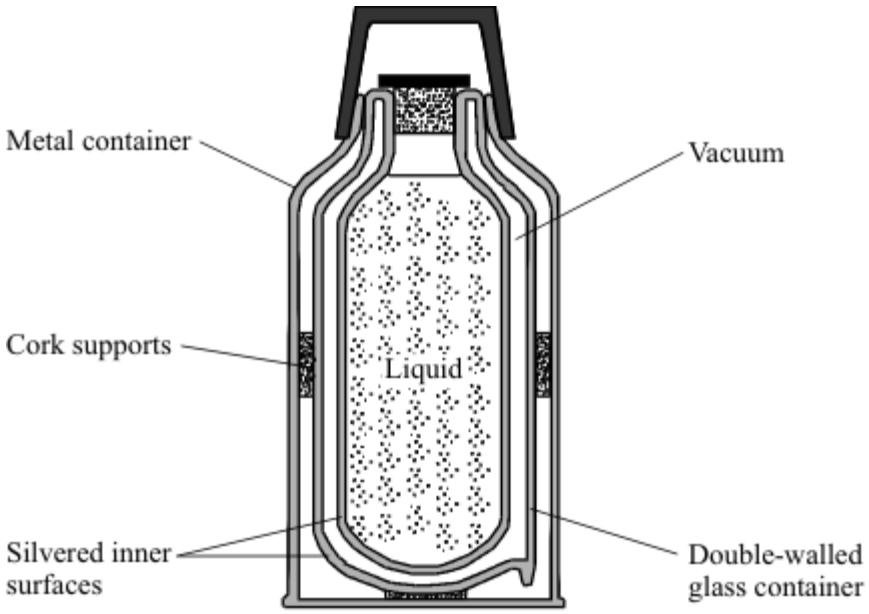
Name of the Student:_____
Max. Marks : 21 Marks **Time : 21 Minutes**

Q1.

The vacuum flask shown has five features labelled, each one designed to reduce heat transfer.



(a) (i) Which labelled feature of the vacuum flask reduces heat transfer by both conduction and convection?

_____

(1)

(ii) Explain how this feature reduces heat transfer by **both** conduction and convection.

_____

_____

_____

_____

_____

(2)

(b) (i) Which labelled feature of the vacuum flask reduces beat transfer by radiation?

_____

(1)

(ii) Explain how this feature reduces heat transfer by radiation.

_____

_____

_____

_____

_____

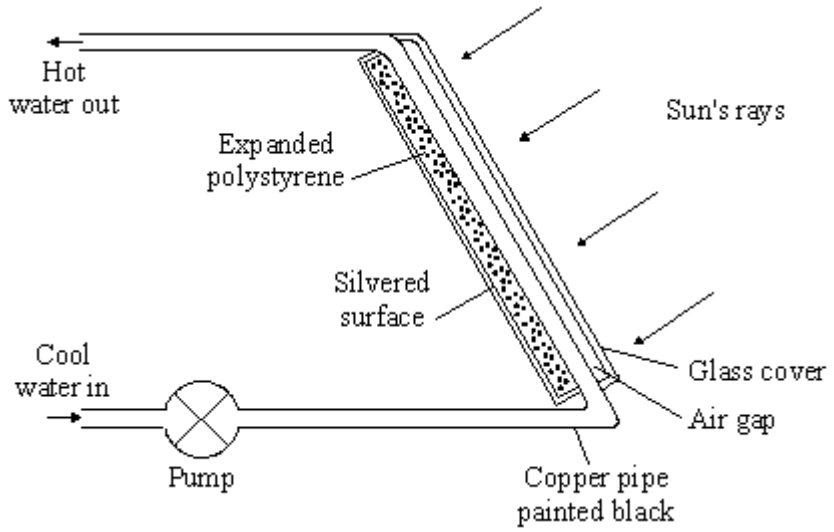
_____

(2)

(Total 6 marks)

Q2.

The diagram shows part of a solar water heater. Water circulating through the solar panel is heated by the Sun.



(i) Complete the following sentence.

Heat energy is transferred from the Sun to the solar panel by

_____ .

(1)

(ii) The pipe inside the solar panel is black. Why?

_____

_____

(1)

(iii) There is a layer of expanded polystyrene behind the black pipe. Why?

_____

_____

(1)

(iv) A silvered surface is used at the back of the solar panel. Explain why.

_____

_____

_____

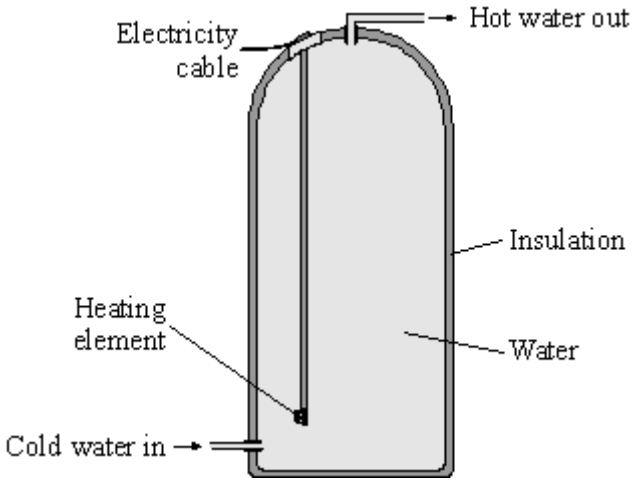
_____

(2)

(Total 5 marks)

Q3.

(a) The diagram shows an immersion heater used to heat water inside a tank. Heat is transferred through the water by convection.



(i) Draw arrows on the diagram to show the movement of the water in the tank when the heating element is switched on.

(2)

(ii) Explain how a convection current is set up in the water. The explanation has been started for you.

When the heating element is switched on, the hot water nearest the element rises

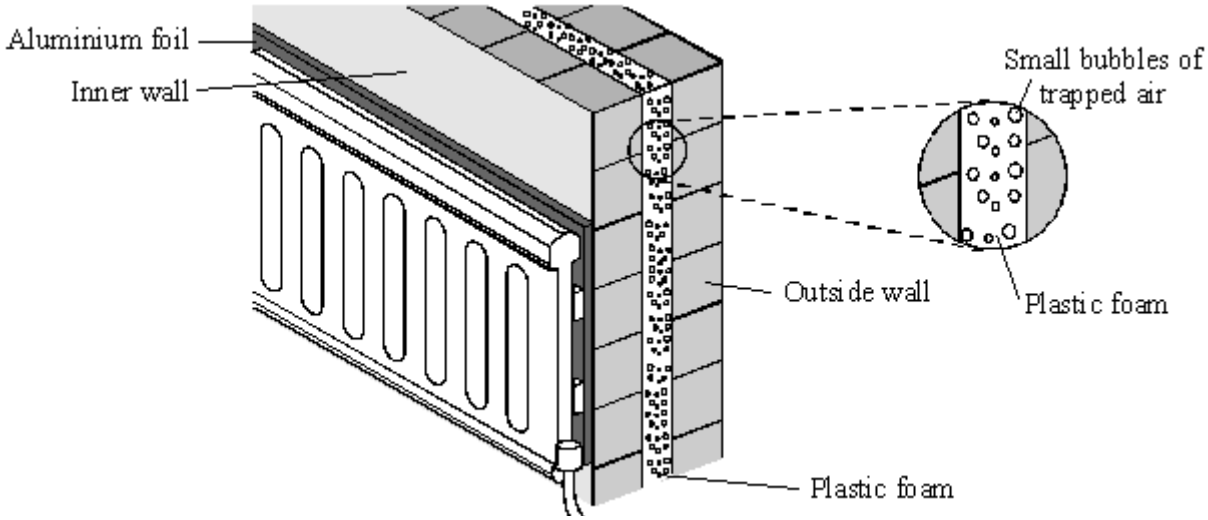
because _____

_____

_____

(2)

(b) The diagram shows **two** ways to reduce heat loss through the walls of a house.



(i) How is the aluminium foil able to reduce heat loss?

_____

_____

(1)

(ii) The plastic foam is good at reducing heat loss through the walls. Explain why.

_____

_____

_____

_____

_____

(3)

(c) Evaporation is an important heat transfer process. When sweat evaporates, it takes heat energy from your body. As humidity increases, you are more likely to feel hot and uncomfortable. Explain why.

_____

_____

_____

(2)

(Total 10 marks)