Practice Question Set For GCSE
Subject : Physics
Paper-1 Topic: Particle Model Of Matter (Standard demand)

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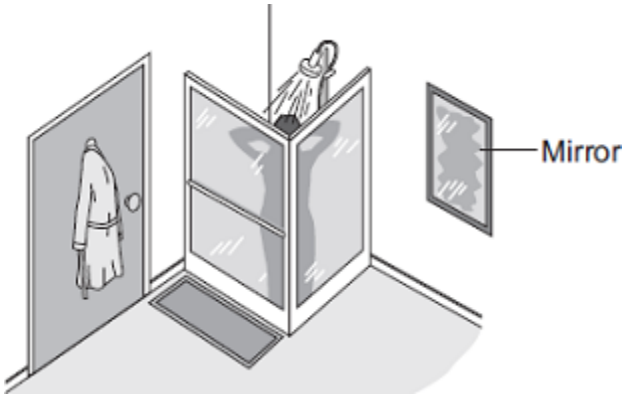
Name of the Student:_____
Max. Marks : 19 Marks **Time : 19 Minutes**

Q1.

The picture shows a person taking a hot shower.



(a) When a person uses the shower the mirror gets misty.

Why?

_____

_____

_____

_____

_____

_____

_____

_____

(3)

(b) The homeowner installs an electrically heated mirror into the shower room.

When a person has a shower, the heated mirror does **not** become misty but stays clear.

Why does the mirror stay clear?

_____

_____

_____

_____

_____

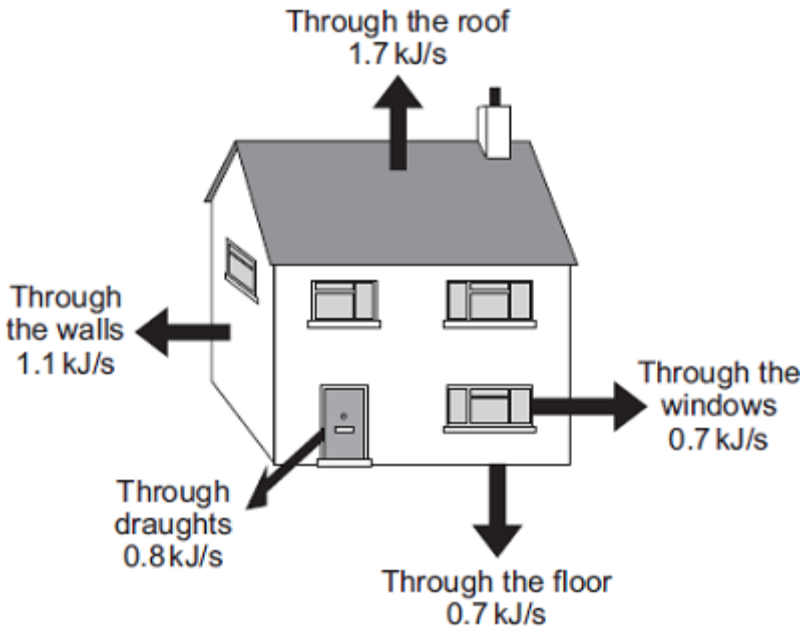
(2)

(Total 5 marks)

Q2.

Diagram 1 shows the energy transferred per second from a badly insulated house on a cold day in winter.

Diagram 1



(a) (i) When the inside of the house is at a constant temperature, the energy transferred from the heating system to the inside of the house equals the energy transferred from the house to the outside.

Calculate, in kilowatts, the power of the heating system used to keep the inside of the house in **Diagram 1** at a constant temperature.

1 kilowatt (kW) = 1 kilojoule per second (kJ/s)

_____

Power of the heating system = _____ kW

(1)

(ii) In the winter, the heating system is switched on for a total of 7 hours each day.

Calculate, in kilowatt-hours, the energy transferred each day from the heating system to the inside of the house.

_____

_____

Energy transferred each day = _____ kWh

(2)

(iii) Energy costs 15 p per kilowatt-hour.

Calculate the cost of heating the house for one day.

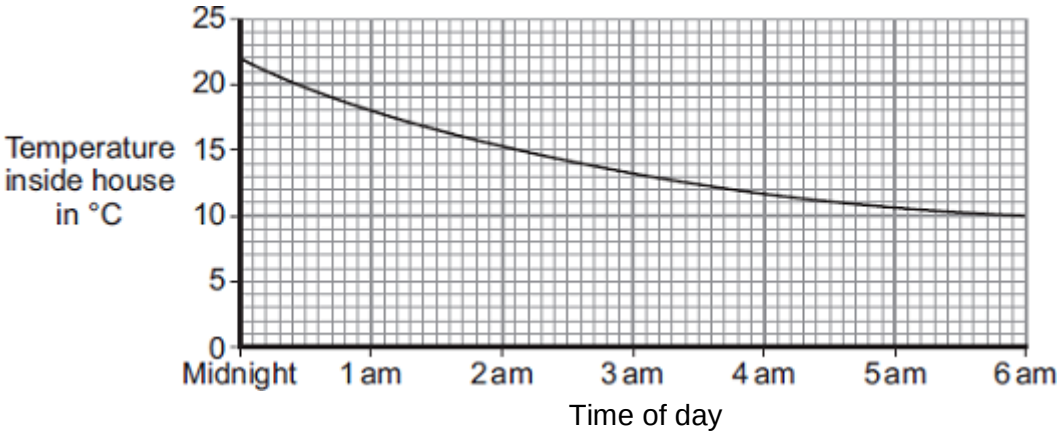
_____

Cost = _____

(1)

(iv) The heating system is switched off at midnight.

The graph shows how the temperature inside the house changes after the heating system has been switched off.



Draw a ring around the correct answer in the box to complete the sentence.

Between midnight and 6 am the rate of energy transfer from

the house

decreases.
decreases then stays constant.
increases.

Give the reason for your answer.

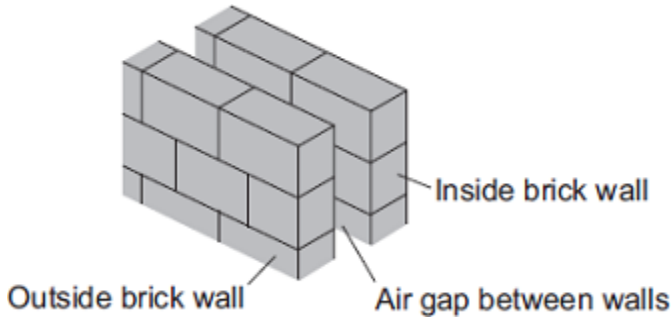
_____

_____

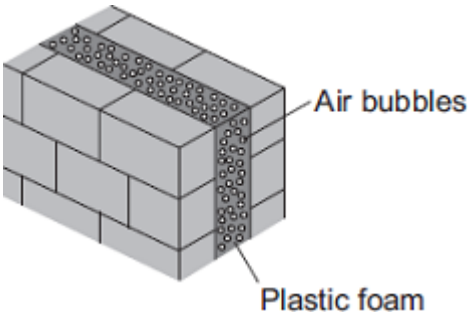
(2)

(b) **Diagram 2** shows how the walls of the house are constructed.
Diagram 3 shows how the insulation of the house could be improved by filling the air gap between the two brick walls with plastic foam.

Diagram 2 **Diagram 3**



U-value of the wall = 0.7



U-value of the wall = 0.3

The plastic foam reduces energy transfer by convection.

Explain why.

_____

_____

_____

_____

(2)

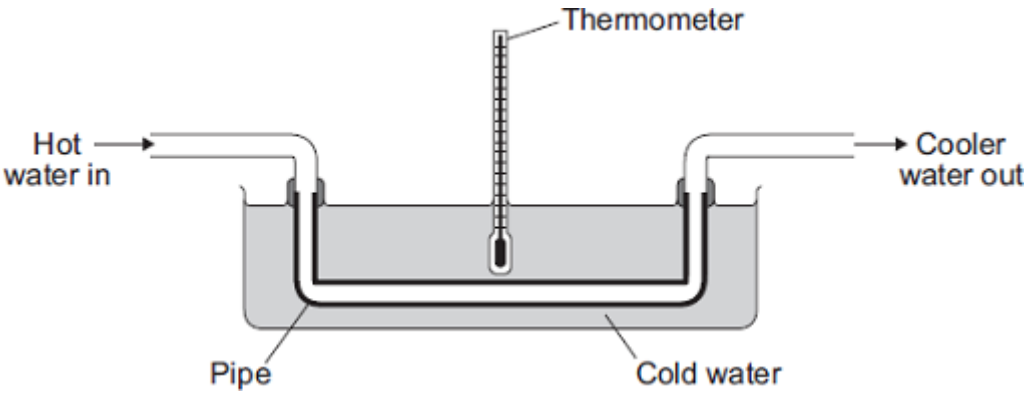
(Total 8 marks)

Q3.

Heat exchangers are devices used to transfer heat from one place to another.

The diagram shows a pipe being used as a simple heat exchanger by a student in an investigation.

Heat is transferred from the hot water inside the pipe to the cold water outside the pipe.



(a) Complete the following sentence by drawing a ring around the correct word in the box.

Heat is transferred from the hot water inside the pipe

to the cold water outside the pipe by

conduction.
convection.
radiation.

(1)

(b) The student wanted to find out if the efficiency of a heat exchanger depends on the material used to make the pipe. The student tested three different materials. For each material, the rate of flow of hot water through the pipe was kept the same.

The student's results are recorded in the table.

Material	Temperature of the cold water at the start in °C	Temperature of the cold water after 10 minutes in °C
Copper	20	36
Glass	20	23
Plastic	20	21

(i) The rate of flow of hot water through the pipe was one of the control variables in the investigation.

Give **one** other control variable in the investigation.

_____

(1)

(ii) Which **one** of the three materials made the best heat exchanger?

_____

Give a reason for your answer.

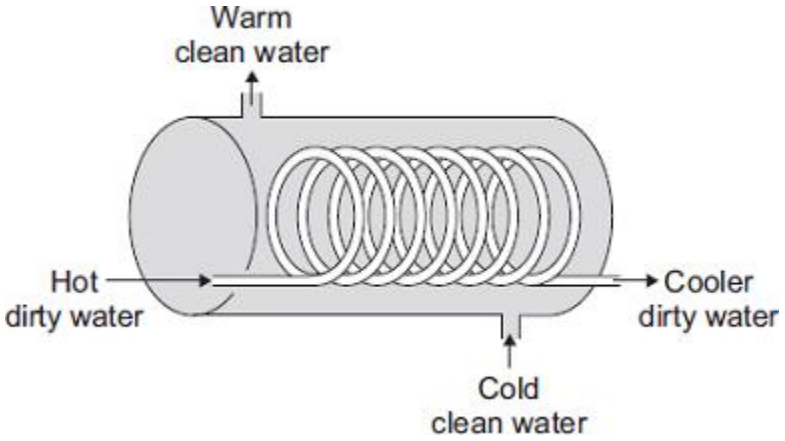
_____

_____

_____

(2)

(c) The student finds a picture of a heat exchanger used in an industrial laundry.
The heat exchanger uses hot, dirty water to heat cold, clean water.



This heat exchanger transfers heat faster than the heat exchanger the student used in the investigation.

Explain why.

_____

_____

_____

_____

(2)

(Total 6 marks)