Practice Question Set For GCSE
Subject : Physics
Paper-1 Topic: Energy (Standard Demand)

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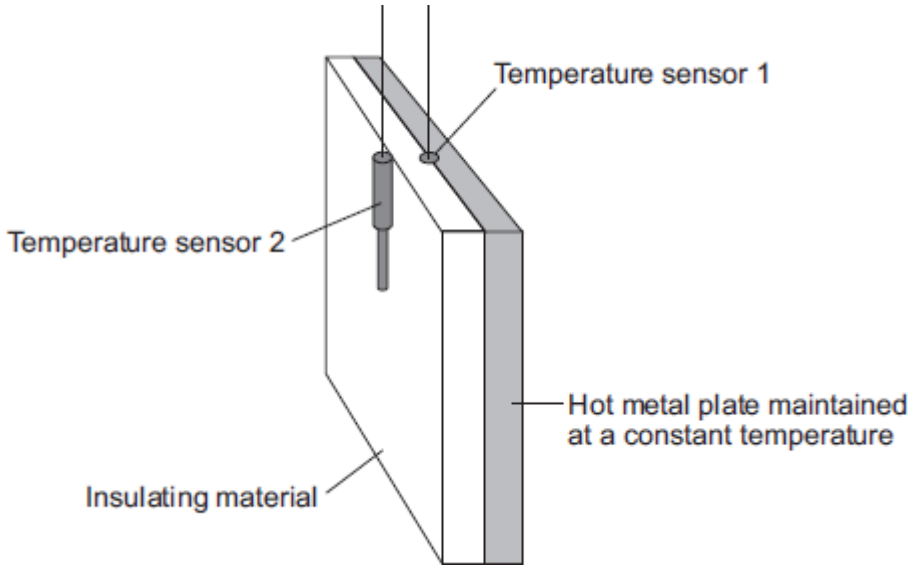
Name of the Student:_____
Max. Marks : 22 Marks **Time : 22 Minutes**

Q1.

(a) A student investigated the insulating properties of three materials.

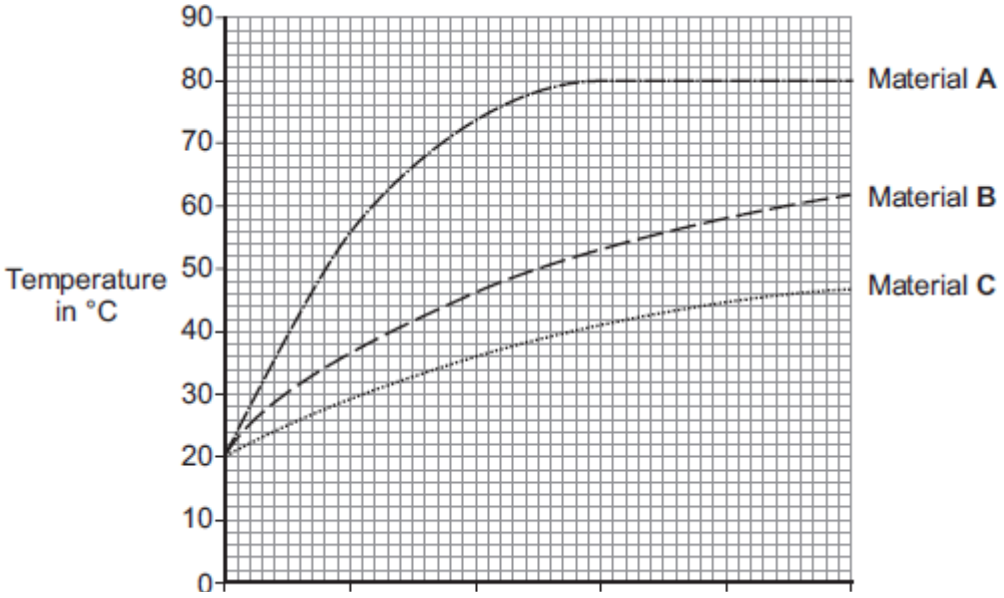
The diagram shows the apparatus the student used.



In the investigation:

- different insulating materials, **A**, **B** and **C**, were placed in contact with the hot metal plate
- temperature sensors measured the temperature on each side of the material
- the difference in temperature across the insulating material was then calculated
- the differences in temperature were compared to measure the effectiveness of each insulating material.

The graph shows how the temperature measured by temperature sensor 2 changed over 10 minutes for each of the materials.



(i) What was the temperature of the hot metal plate? _____ °C

(1)

(ii) Which material, **A**, **B** or **C**, is the best insulator?

Material: _____

Give a reason for your answer.

_____

_____

(2)

(b) The table shows information about three home insulation methods for an average sized home.

Insulation method	**Cost of insulation in £**	**Savings per year in £**
Double glazing	5000	60
Draught excluders	90	30
Loft insulation	350	150

Which method of home insulation is the most cost-effective over 10 years?

You must include calculations in your answer.

_____

_____

_____

_____

_____

_____

_____

_____

(4)

(Total 7 marks)

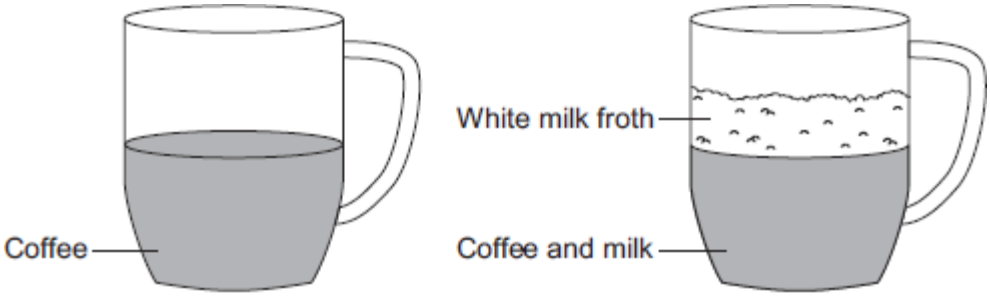
Q2.

A student drinks two different types of coffee.

- Americano coffee is coffee and water.
- Cappuccino coffee is coffee with milk and milk froth.

The student observed that a cup of Americano coffee cools down faster than a cup of Cappuccino coffee. Both the Americano and Cappuccino coffees are served at the same temperature.

The diagrams show the differences between Americano coffee and Cappuccino coffee.



Americano coffee
(no milk)

Cappuccino coffee
(with milk)

(a) The milk froth is white and contains lots of air bubbles.

Suggest why the Cappuccino coffee cools down more slowly than the Americano coffee.

_____

_____

_____

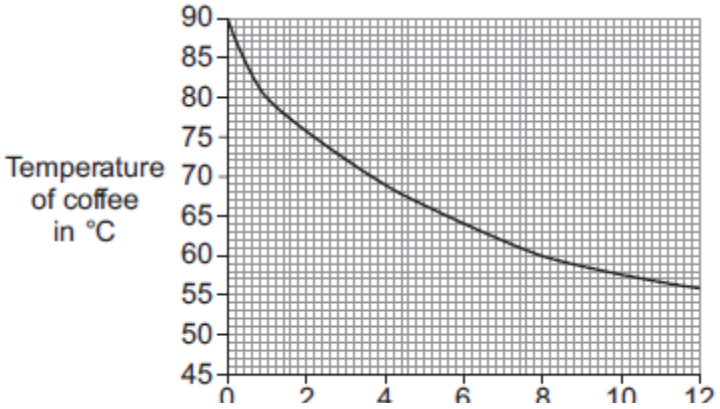
_____

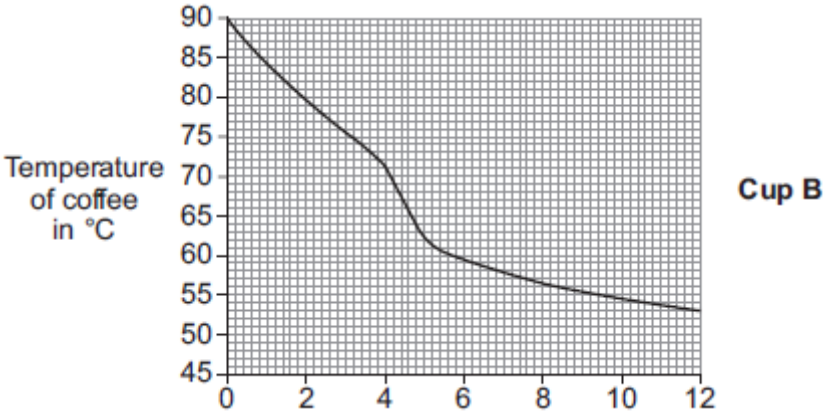
(2)

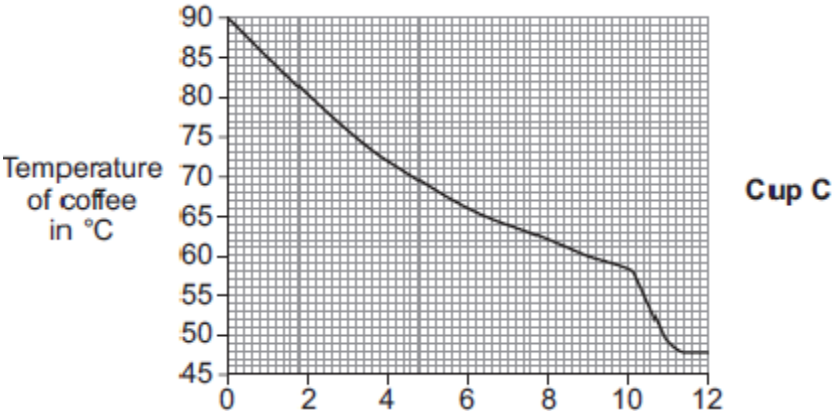
(b) The student investigated how adding milk to coffee at different times affected the temperature of the coffee.

- The student poured the same volume of coffee into three identical cups, **A**, **B** and **C**.
- The coffee started at a temperature of 90°C.
- The student poured the milk into the cups.
- The milk had a temperature of 5°C.
- The milk was added to the three cups after different periods of time.

The graphs show the results.







(i) What was the independent variable in the investigation?

_____

(1)

(ii) Use the graph to identify the time when cold milk was added to cup **B**.

Give a reason for your answer.

Time: _____

Reason: _____

_____

(2)

(iii) Which cup of coffee transfers energy to the surroundings at the slowest rate over 12 minutes?

Give a reason for your answer.

Cup: _____

Reason: _____

_____

(2)

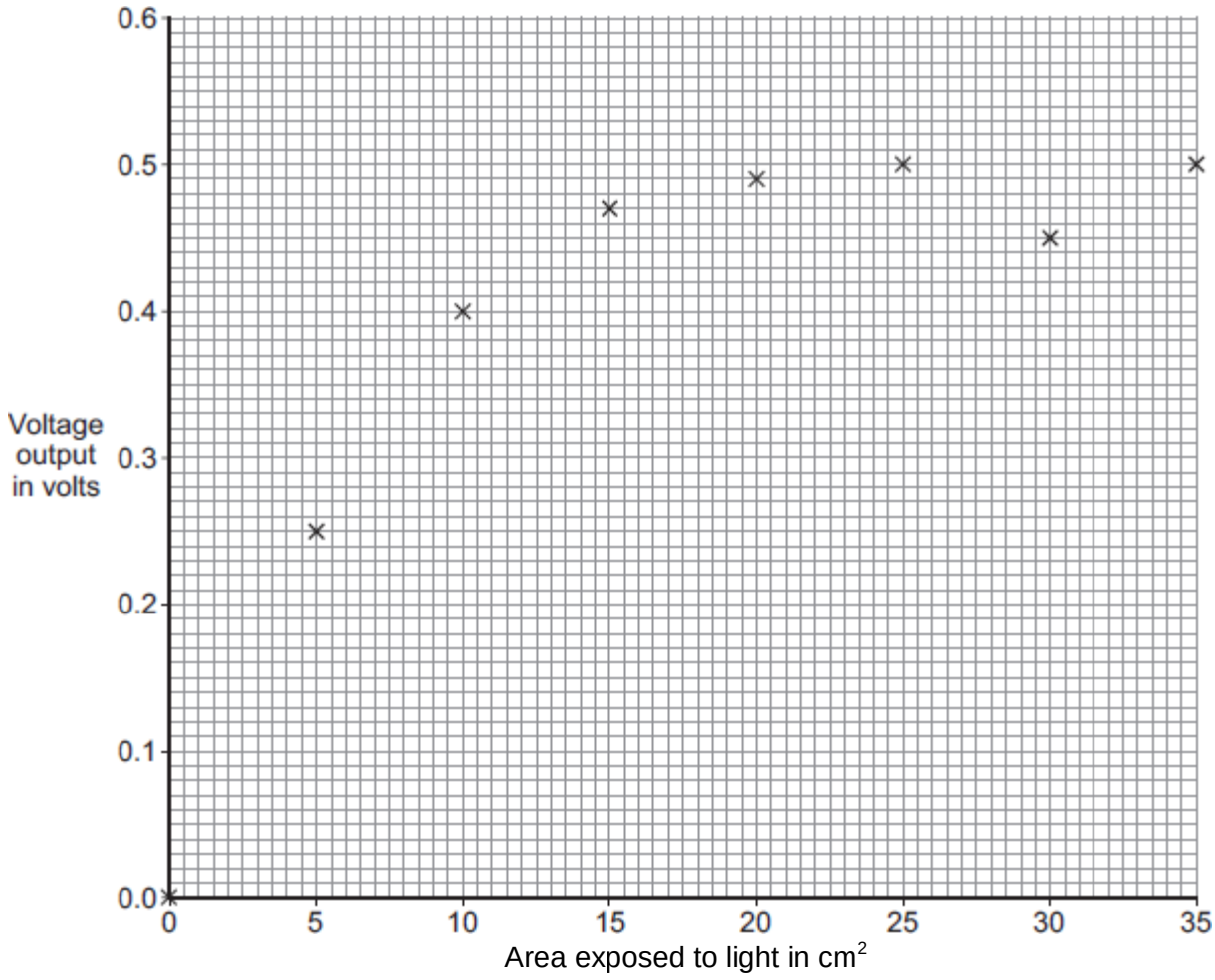
(Total 7 marks)

Q3.

A student is investigating how the voltage output of a solar cell depends on the area of the solar cell exposed to light.

He shines a desk light at a solar cell. He varies the area of the solar cell exposed to the light and records the voltage output.

The graph shows the student's results.



(a) One of the results on the graph is anomalous.

(i) Draw a ring around the anomalous result on the graph.

(1)

(ii) Suggest what the student could do about the anomalous result.

_____

_____

(1)

(b) Give **two** conclusions that can be made from these results.

_____

_____

_____

_____

(2)

(c) Most houses use electricity from the National Grid.

Some houses have panels made from many solar cells joined together. These panels produce electricity for the house.

(i) Houses with panels of solar cells remain connected to the National Grid.

Give **two** reasons why.

_____

_____

_____

_____

(2)

(ii) Producing electricity for a house using solar cells is better for the environment than using electricity from coal-fired power stations.

Give **two** reasons why.

_____

_____

_____

_____

(2)

(Total 8 marks)