

Name of the Student: \_\_\_\_\_

Max. Marks : 19 Marks

Time : 19 Minutes

**Q1.**

Light bulbs are labelled with a power input.

(a) What does power input mean?

Tick (✓) **one** box.

The charge transferred each second by the bulb.

The current through the bulb.

The energy transferred each second to the bulb.

The potential difference across the bulb.

(1)

(b) Write down the equation which links current, potential difference and power.

\_\_\_\_\_

(1)

(c) A light bulb has a power input of 40 W

The mains potential difference is 230 V

Calculate the current in the light bulb.

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Current = \_\_\_\_\_ A

(3)

The following table shows information about three different light bulbs.

Light bulb	Total power input in watts	Useful power output in	Efficiency
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		watts	
P	6.0	5.4	0.90
Q	40	2.0	0.05
R	9.0	X	0.30

(d) Write down the equation which links efficiency, total power input and useful power output.

\_\_\_\_\_

(1)

(e) Calculate the value of **X** in the table above.

\_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

$X = \text{_____ W}$

(3)

(f) In addition to power input, light bulbs should also be labelled with the rate at which they emit visible light.

Suggest why.

\_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

(2)

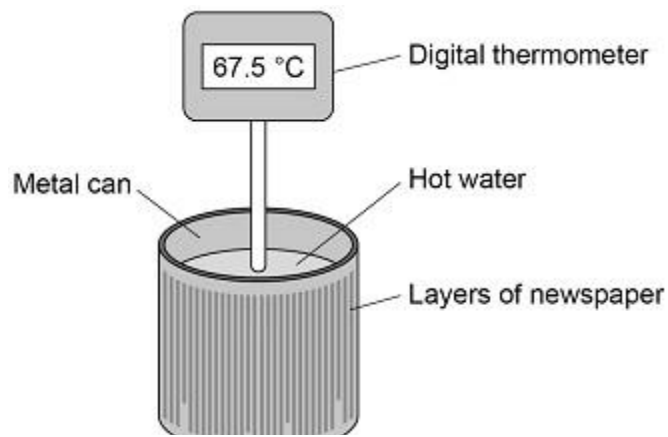
(Total 11 marks)

**Q2.**

A student investigated the insulating properties of newspaper.

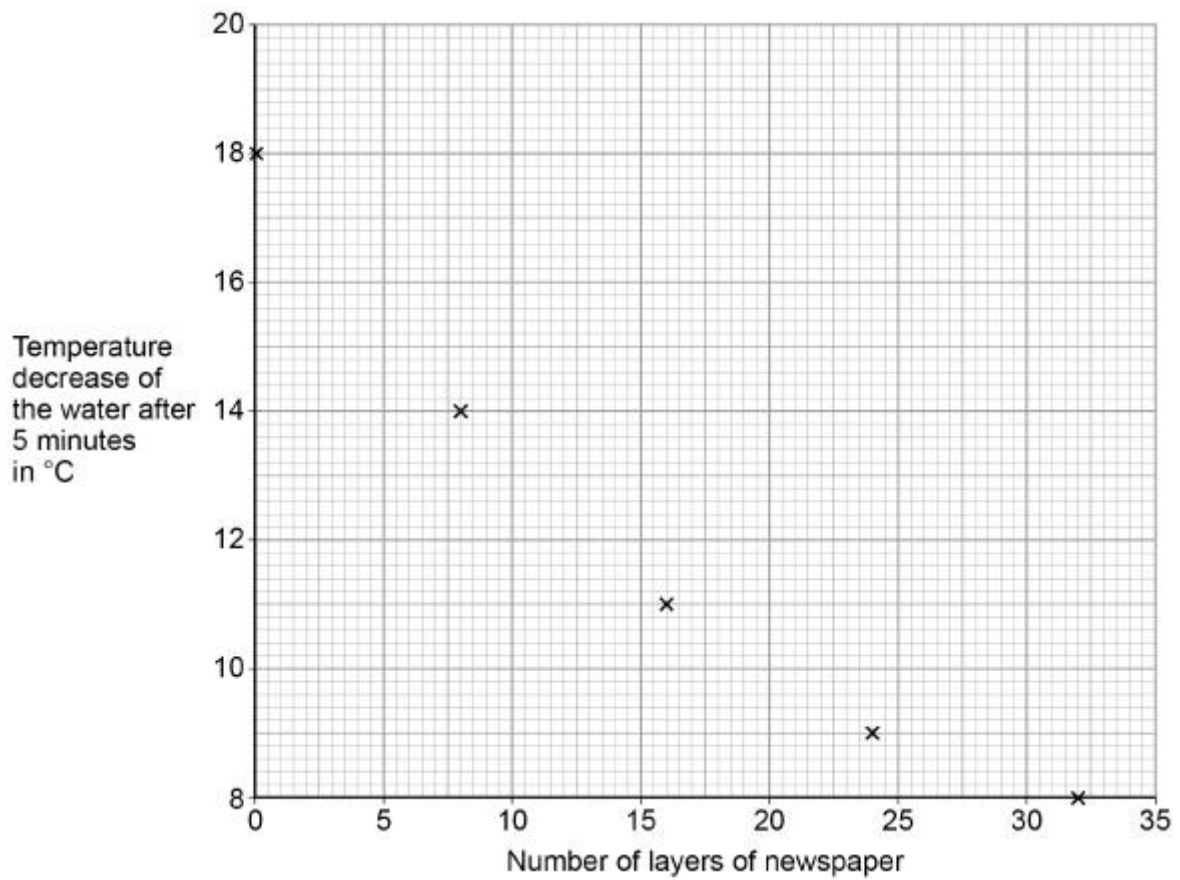
**Figure 1** shows the apparatus the student used.

**Figure 1**



The student's results are shown in **Figure 2**.

**Figure 2**



(a) Describe a method the student could have used to obtain the results shown in **Figure 2**.

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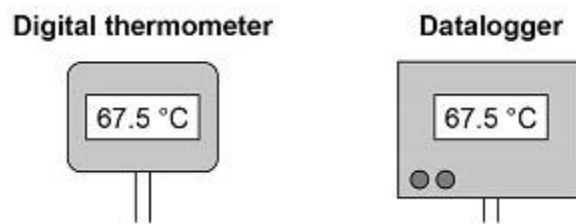
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(6)

- (b) The student could have used a datalogger with a temperature probe instead of the digital thermometer.

**Figure 3** shows the readings on the digital thermometer and the datalogger.

**Figure 3**



The datalogger records 10 readings every second.

The student considered using a temperature probe and datalogger.

Explain why it was **not** necessary to use a temperature probe and datalogger for this investigation.

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(2)

(Total 8 marks)