Name of the Student:_____
Max. Marks : 18 Marks **Time : 18 Minutes**

Q1.

When sound waves reach a material, some of the energy of the sound is reflected and some is transmitted through the material.

(a) Complete the sentence.

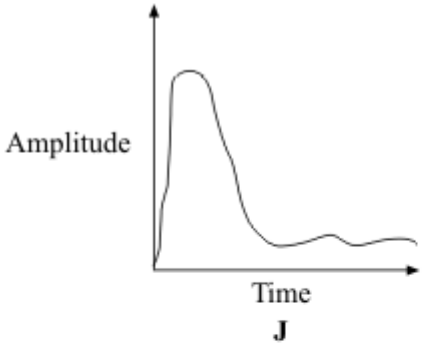
Sound waves are caused by _____

(1)

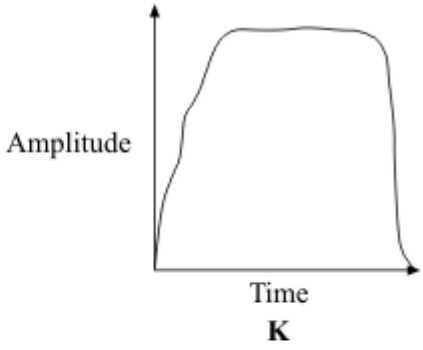
(b) The graphs **J**, **K**, **L** and **M** represent the sound energy reflected from a surface.

The graphs are all drawn to the same scale.

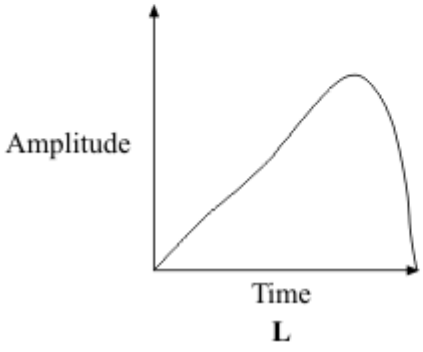
Which graph shows the greatest total sound energy output from the surface?



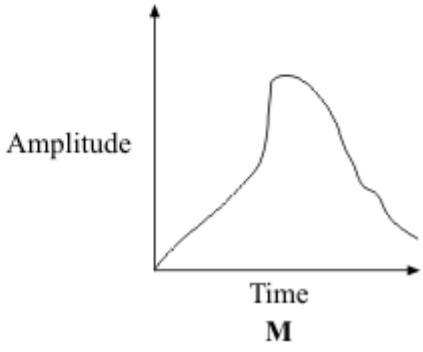
J



K



L



M

Graph _____

(1)

(c) The proportion of the sound energy which is reflected or transmitted depends on the material which receives the sound.

A student investigates different materials.

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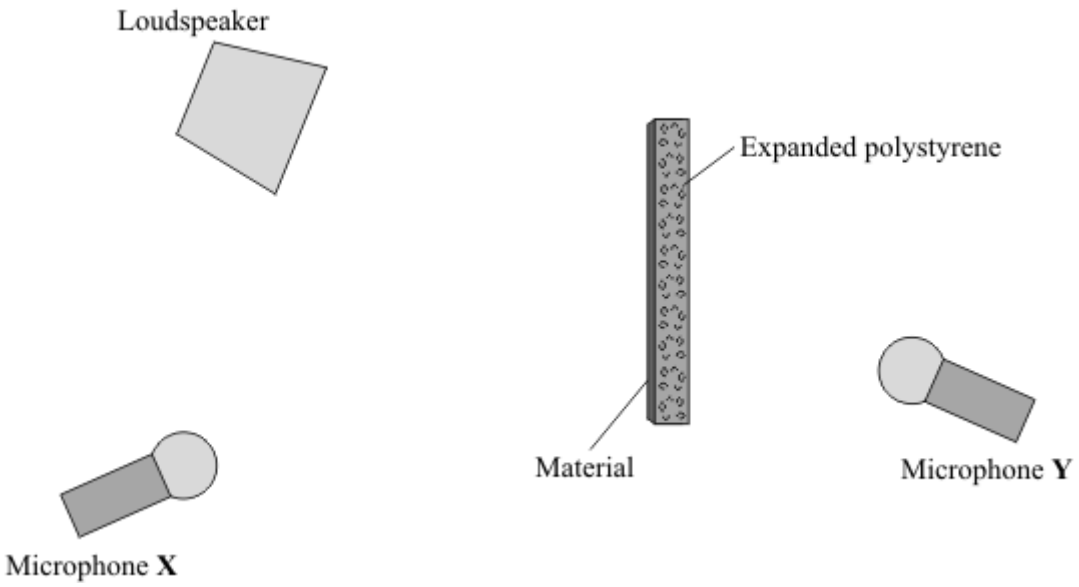
The diagram shows how a student sets up her equipment.

(i) Using a pencil and ruler to draw on the diagram, show how microphone **X** receives reflected sound.



(2)

(ii) The student tests four materials. Each sheet of material is 1 mm thick. This has been glued onto a block of expanded polystyrene.

Why does the student use the same size of expanded polystyrene block and the same sound level for each test?

_____

_____

(1)

(iii) The table shows the readings for the sound level transmitted to microphone **Y**.

Soundlevel from loudspeaker in arbitrary units	**Surface material**	**Soundlevel transmitted to microphone Y in arbitrary units**
60	paper	39
60	plaster	18
60	cloth	31
60	wood	15

[A] Which surface material transmits the smallest proportion of the sound?

_____

(1)

[B] What proportion is this?

_____

(1)

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(d) People living in a flat have very noisy neighbours who are always playing loud music.

Suggest **one** practical idea to reduce the amount of noise transmitted into the flat through the walls and explain how your idea will work.

_____

_____

_____

_____

_____

_____

(2)

(Total 9 marks)

Q2.

The drawing shows someone ironing a shirt. The top of the ironing board is covered in a shiny silver-coloured material.

Explain why the shiny silver-coloured material helps to make ironing easier.

_____

_____

_____

_____

(Total 2 marks)

Q3.

A student was asked to investigate the heat loss from two metal cans, L and M. The cans were identical except for the outside colour.

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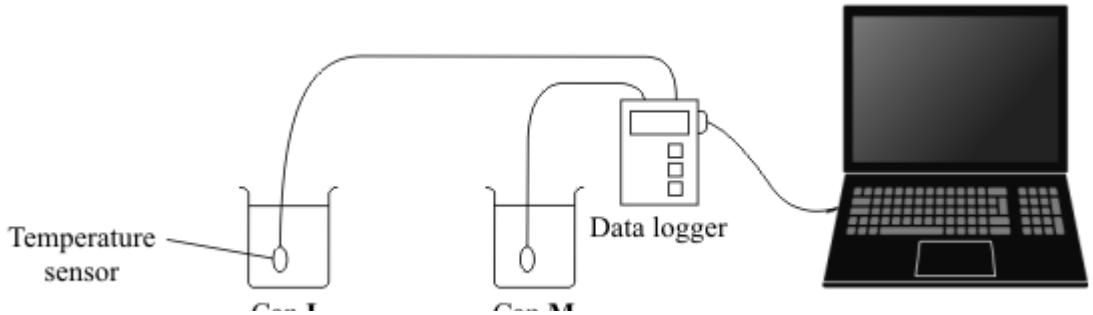
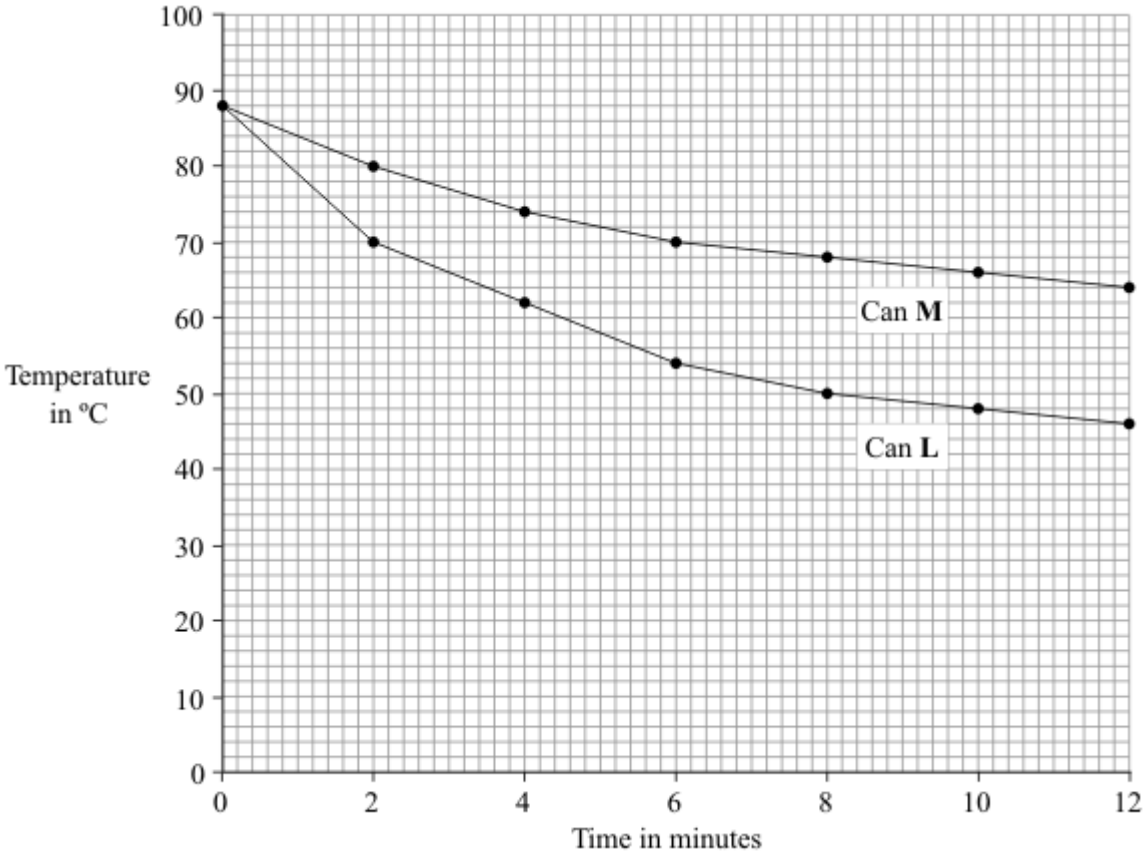


The student filled the two cans with equal volumes of hot water. He then placed the temperature sensors in the water and started the data logger. The computer used the data to draw the graph below.



(a) Which **one** of the following is a categoric variable?

Put a tick (✓) in the box next to your answer.

the outside colour of the cans ☐

the starting temperature of the hot water ☐

the time ☐

the volume of hot water ☐

(1)

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(b) For can **L**, state the temperature drop of the water:

(i) in the **first** two-minute interval

_____

(1)

(ii) in the **second** two-minute interval.

_____

(1)

(c) In both cans the water cooled faster at the start of the investigation than at the end of the investigation. Why?

_____

_____

(1)

(d) One can was black on the outside and the other can was white on the outside.

What colour was can **L**? _____

Explain the reason for your answer.

_____

_____

_____

(3)

(Total 7 marks)

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