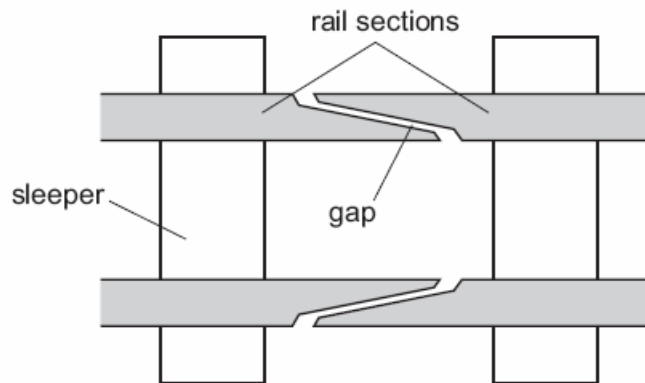


NAME:

THERMAL EXPANSION

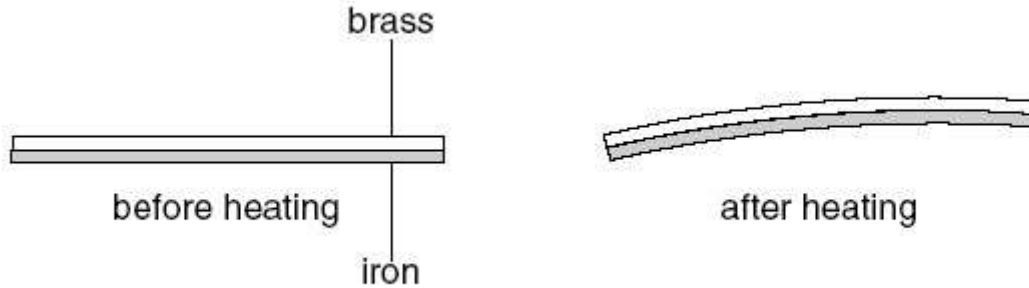
1. To mark the lower fixed point of a Celsius scale on a thermometer, the thermometer should be placed in
 - A. pure alcohol.
 - B. pure distilled water.
 - C. pure melting ice.
 - D. pure mercury.

2. At regular intervals along a railway line there is a gap between the rail sections.



- What is the reason for the gap between the rail sections?
- A. to allow for expansion of the rail sections during hot weather
 - B. to allow for vibrations of the rail sections as the train passes over them
 - C. to allow rain water to drain from the rail sections
 - D. to keep the wheels of the train and carriages on the rail sections
3. To mark the lower fixed point of a Celsius scale on a thermometer, the thermometer should be placed in
 - A. pure alcohol.
 - B. pure distilled water.
 - C. pure melting ice.
 - D. pure mercury.

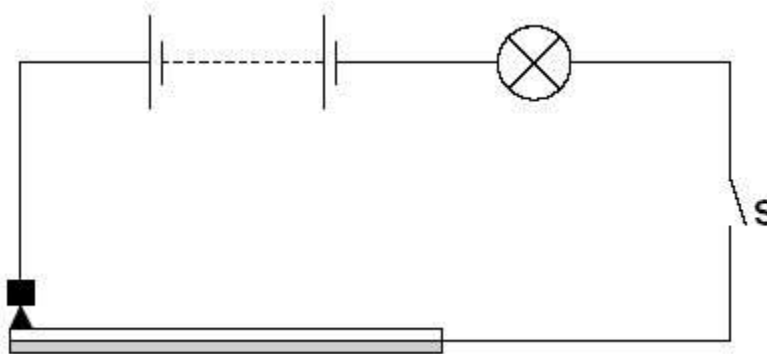
4. Fig 10.1 shows a bimetal strip before and after being heated.



(a) Explain why the strip bends when it is heated.

.....
.....
..... [2]

(b) Fig. 10.2 shows a similar strip in a circuit.



(i) Explain why the lamp flashes on and off when switch S is closed.

.....
.....

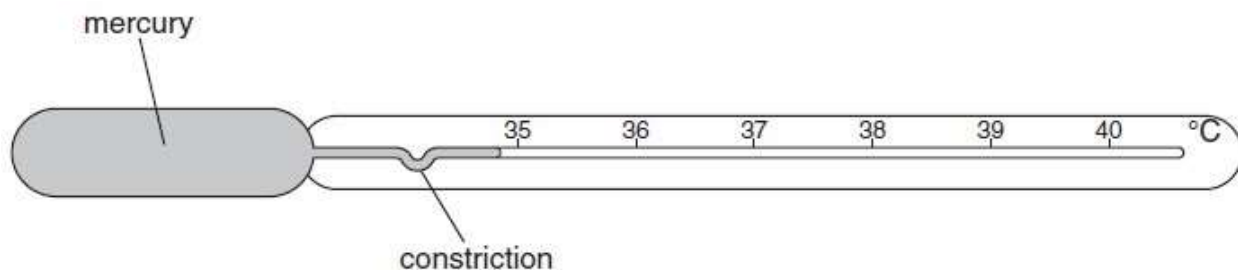
..... [3]

(ii) Suggest a use for such a circuit.

..... [1]

[Total 6m]

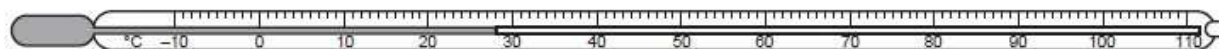
5. A clinical thermometer is shown in figure below.



State and explain a feature of the clinical thermometer that improves the thermometer's sensitivity.

[2]

6. The figure below shows a laboratory thermometer.



(a) (i) State the range of the thermometer.

..... [1]

(ii) State one change in the design of the thermometer to increase its range.

(b) (i) Describe how the behaviour of a more sensitive thermometer is different from a less sensitive thermometer. [1]

[1]

(ii) State one change in the design of the thermometer to make it more sensitive.

[1]

(c) Describe how a clinical thermometer differs from a laboratory thermometer. A diagram may be included in your answer.

[3]

[Total 7 marks]

7. (a) Equal volumes of a gas held at constant pressure, a liquid and a solid undergo the same temperature rise.

(i) State which of the three, solid, liquid or gas,

1. expands the most,

2. expands the least.

(ii) Explain why the pressure of the gas must be kept constant for this comparison.

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.....[2]

(b) Fig. 5.1 shows.

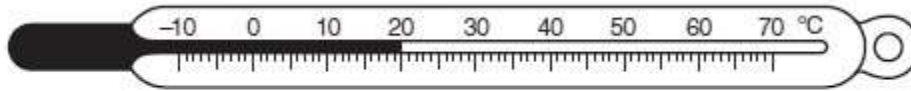


Fig. 5.1

(i) State two properties of alcohol which make it suitable for use in a thermometer.

1.

.....

2.

.....[2]

(ii) State two changes to the design of this thermometer which would make it more sensitive.

1.

.....

2.

.....[2]

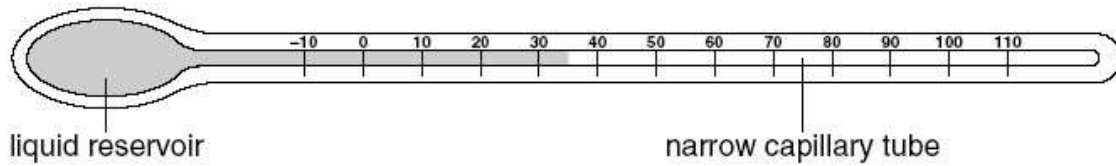
(c) Explain why it is an advantage for the glass surrounding the alcohol in the bulb of the thermometer to be very thin.

.....

.....[1]

[Total: 7]

8. (a) The figure below shows a liquid-in-glass thermometer.



(i) Name a suitable liquid to use in the thermometer.

.....

(ii) State the reading on the thermometer. °C

(iii) Explain why a narrow capillary tube is used.

.....

..... [3]

(b) The thermometer bulb is put in melting ice.

(i) Explain why the liquid moves in the capillary tube.

.....

.....

.....

(ii) Mark on the diagram the new position of the liquid. [3]

[Total 6m]