

7: Thermal physics – Topic questions

Paper 3

The questions in this document have been compiled from a number of past papers, as indicated in the table below.

Use these questions to formatively assess your learners' understanding of this topic.

Question	Year	Series	Paper number
6	2016	June	31
7	2016	June	31
4	2016	March	32

The mark scheme for each question is provided at the end of the document.

You can find the complete question papers and the complete mark schemes (with additional notes where available) on the School Support Hub at www.cambridgeinternational.org/support

- 6 Fig. 6.1 shows an experiment to observe the motion of smoke particles in air.

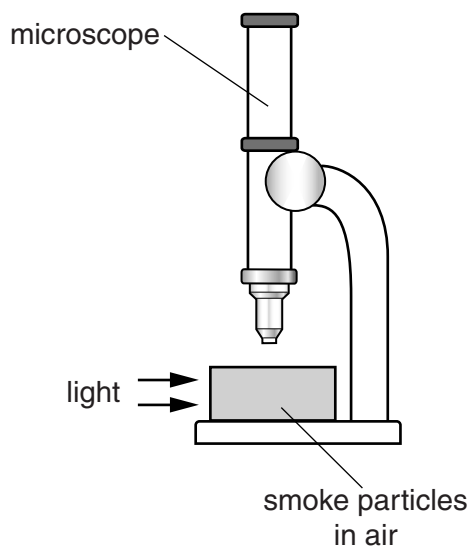


Fig. 6.1

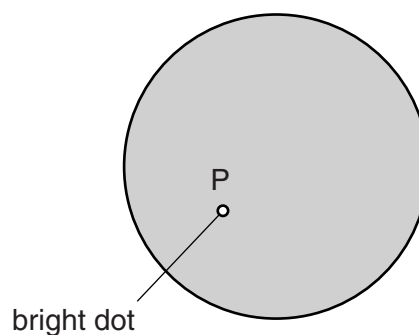


Fig. 6.2

- (a) (i) Fig. 6.2 shows the view through the microscope of one smoke particle, labelled P.

On Fig. 6.2, draw 3 lines to show the movement of this particle.

[2]

- (ii) Explain what causes the smoke particle to move.

.....

.....

.....

.....[2]

- (b) The air containing the smoke particles becomes warmer.

Suggest how this changes the movement of the smoke particles.

.....

.....[1]

[Total: 5]

- 7 Fig. 7.1 shows equipment used to demonstrate thermal expansion.

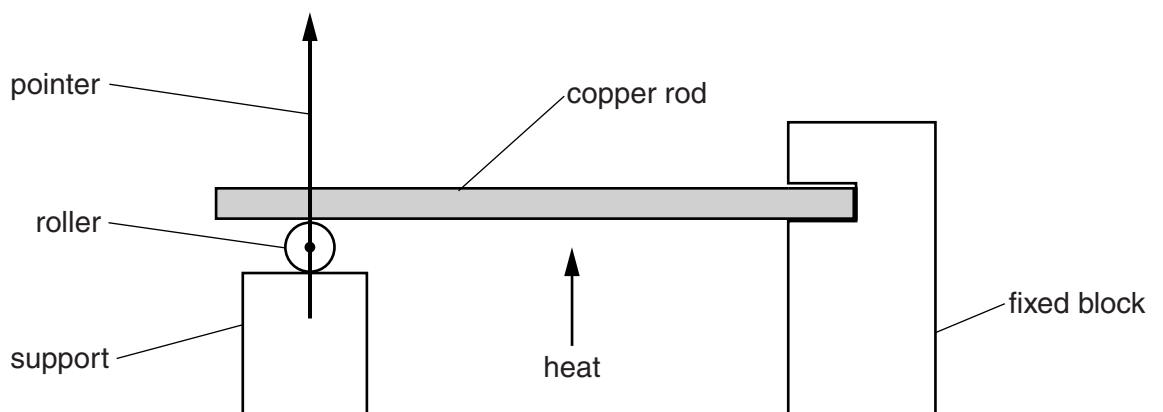


Fig. 7.1

- (a) The copper rod is heated and expands. It turns the roller and moves the pointer.

On Fig. 7.1, draw the new position of the pointer.

[1]

- (b) As the rod is heated, some of its properties change.

Identify how each property changes. Place **one** tick in each row of the table.

property of rod	decreases	increases	stays the same
volume			
mass			
density			

[3]

- (c) Suggest **one** disadvantage of thermal expansion.

.....[1]

[Total: 5]

- 4 Fig. 4.1 shows a balloon near a window on a warm sunny day.

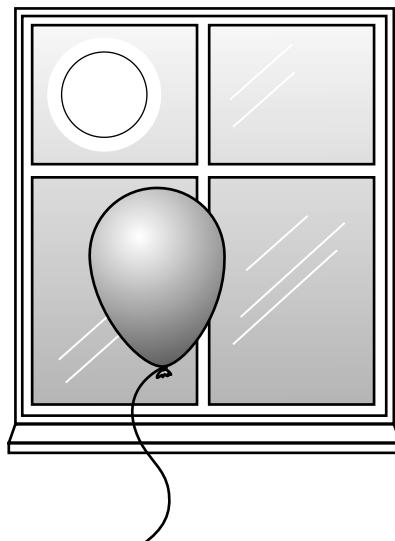


Fig. 4.1

Fig. 4.2 shows how the volume of the balloon changes throughout the day.

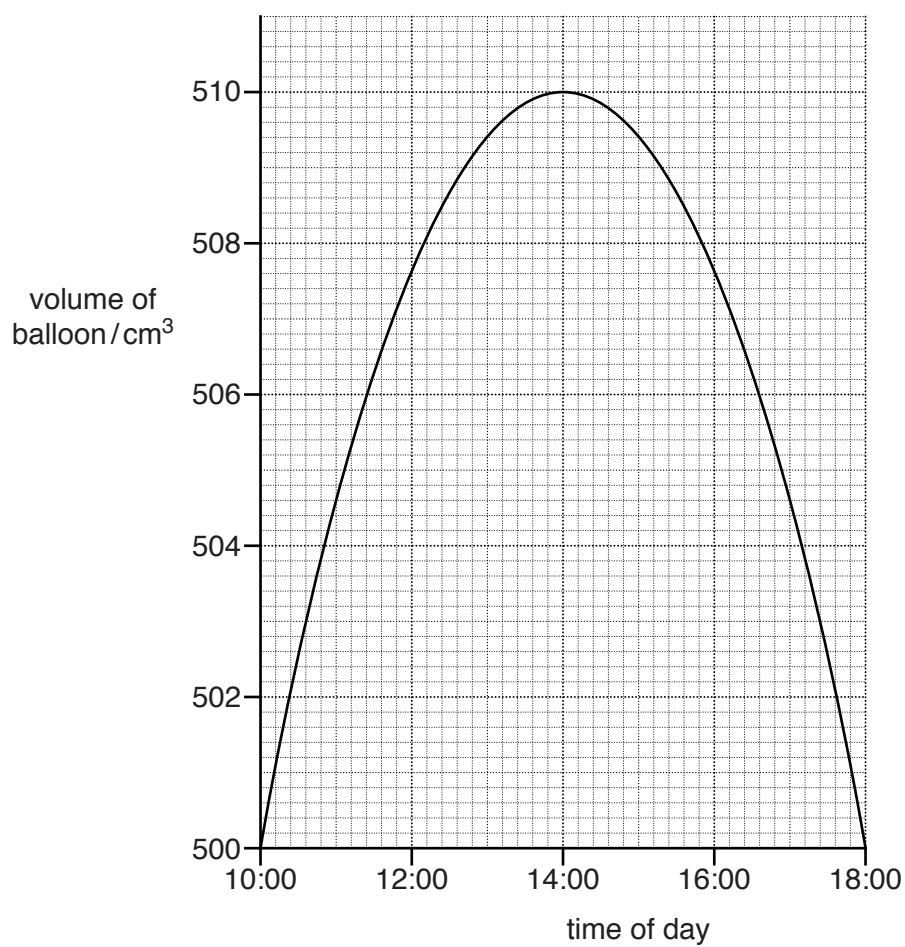


Fig. 4.2

(a) Describe how the volume changes throughout the day.

.....[1]

(b) Explain, in terms of the gas molecules inside the balloon, why the volume changes in this way between 10:00 and 14:00.

.....
.....
.....
.....
.....
.....[3]

[Total: 4]

Question	Answer	Mark
6 (a) (ii)	three straight lines, joined end to end at least two changes of direction	B1 B1
6 (a) (ii)	collisions OR bumps OR bounces off (with moving) air molecules	B1 B1
6 (b)	more collisions OR changes of direction	B1
		Total: 5
7 (a)	to the left OR anticlockwise	B1
7 (b)	row 1 – increases row 2 – stays the same row 3 – decreases	B1 B1 B1
7 (c)	electric cables lower to ground OR telephone lines in summer OR buckling tracks	B1
		Total: 5
4 (a)	volume of balloon increases (until 14:00) then decreases again	B1
4 (b)	any three from: <ul style="list-style-type: none"> temperature (in room / balloon) increases gas molecules move faster / have more energy OR collisions more energetic when heated more frequent / harder collisions collisions result in greater force on balloon (surface) / gas pressure increases 	B3
		Total: 4

Notes about the mark scheme are available separately.