

Name of the Student: _____

Max. Marks : 19 Marks

Time : 19 Minutes

Q1.

A student investigates how the angle of refraction varies with the angle of incidence when light enters a glass block.

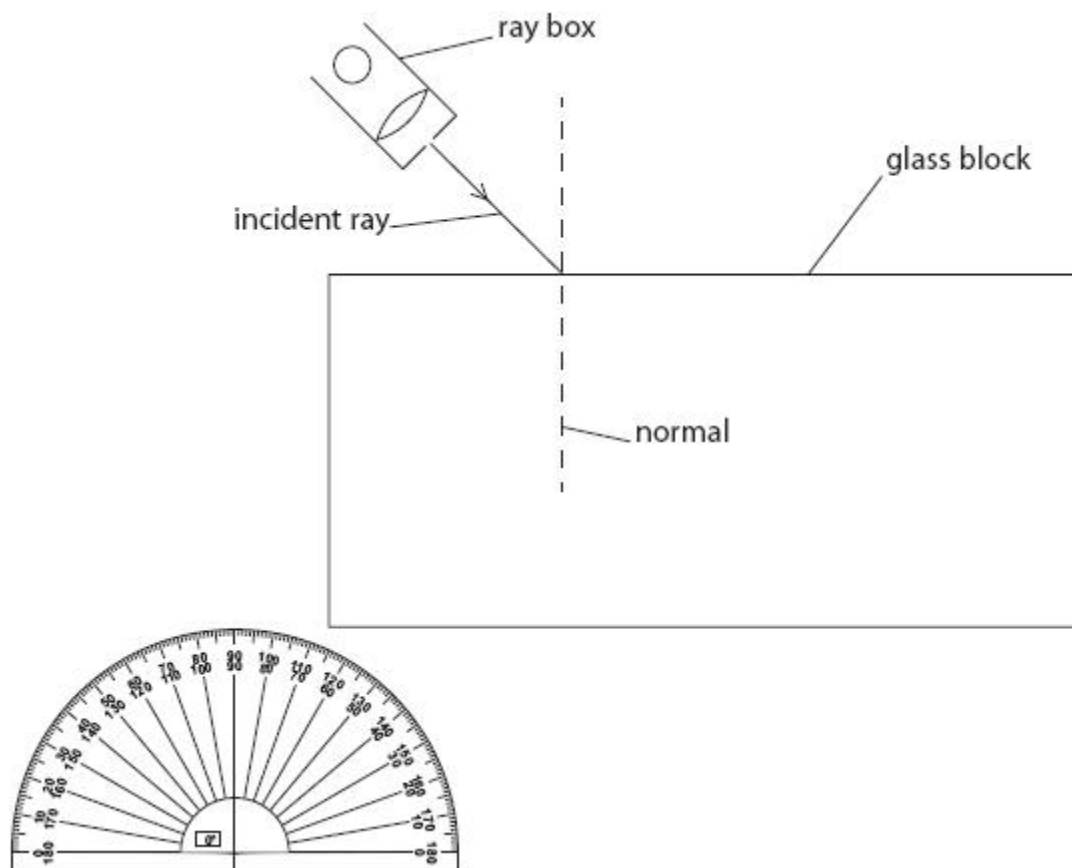


Figure 5

Describe how the student should perform this investigation.

(4)

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(Total for question = 4 marks)

Q2.

A student investigates how light behaves as it leaves a clear plastic block.

Figure 4 shows some of her equipment and the path of a ray of light through the block.

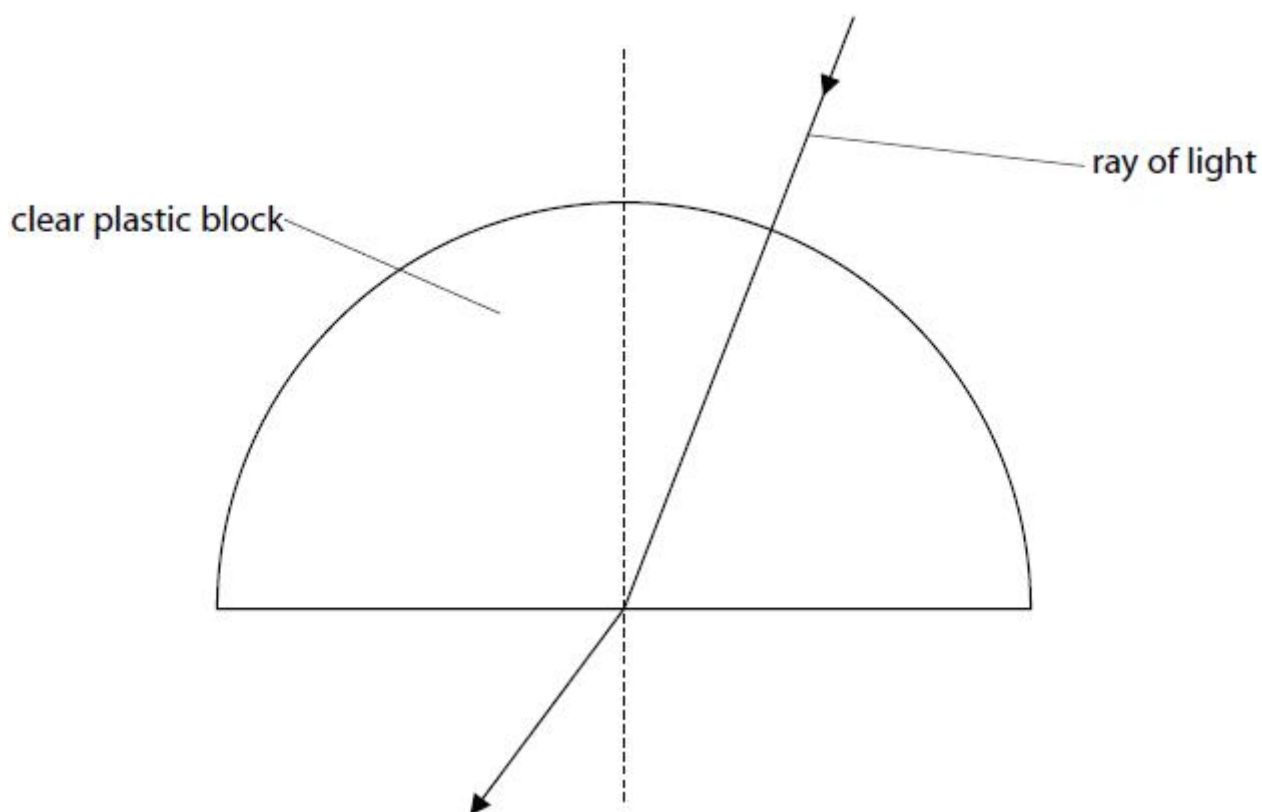


Figure 4

(a) Describe how the student can make sure the light does not change direction as it enters the block.

(2)

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(b) Describe what happens to the ray of light when the angle of incidence is increased beyond the critical angle.

(2)

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(Total for question = 4 marks)

Q3.

A student investigates how the surface of an object affects the radiation it emits.
Figure 7 shows the equipment he uses.

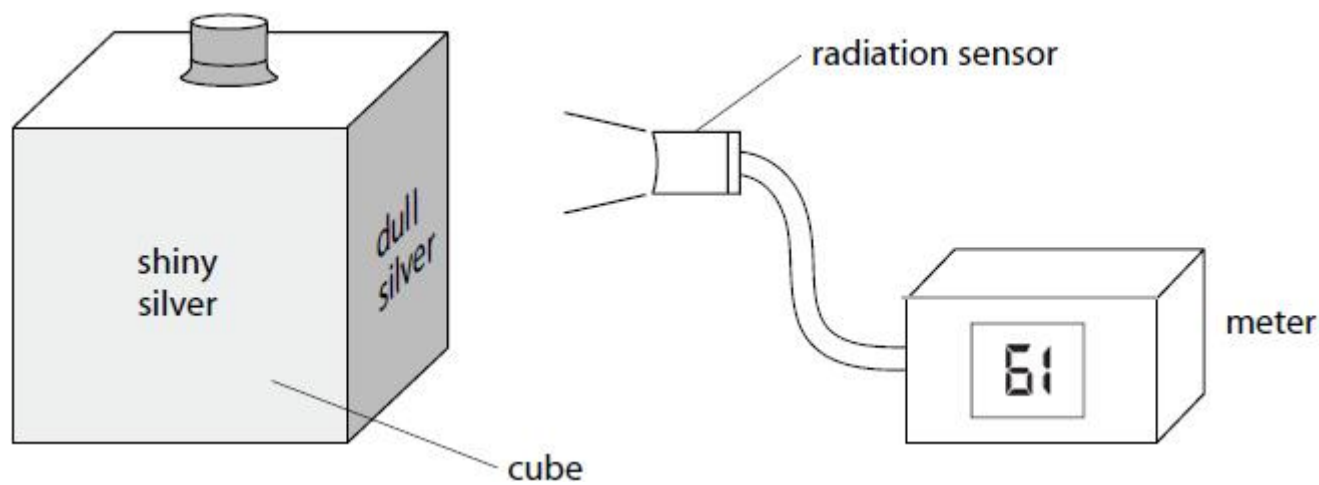


Figure 7

The cube has four different surfaces.
He fills the cube with boiling water so that the temperature of each surface is the same.
He uses the radiation sensor to measure the radiation emitted from each surface.

(i) His readings are shown.

Draw a line from each surface colour to its correct meter reading. One has been done for you.

(2)

surface colour		meter reading
shiny black	•	• 87
dull black	•	• 61
dull silver	•	• 70
shiny silver	•	• 47

Note: A line is drawn from the dot next to 'dull silver' to the dot next to '61'.

(ii) The temperature of each surface is the same.

Give a reason why the radiation sensor gives a different reading for each surface.

(1)

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(Total for question = 3 marks)

Q4.

Answer the question with a cross in the box you think is correct ☒. If you change your mind about an answer, put a line through the box ☒ and then mark your new answer with a cross ☒.

Figure 6 shows two solid metal balls, **P** and **Q**.

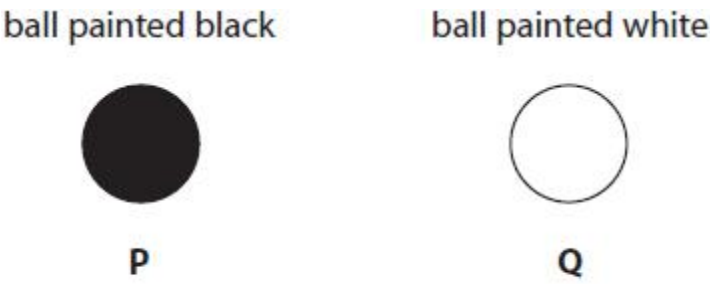


Figure 6

P and **Q** are made from the same metal and have the same radius.

P is painted black and **Q** is painted white.

Each ball is heated to a different temperature.

The balls then cool in the same room.

The graph in Figure 7 shows how the temperature of each ball changes with time.

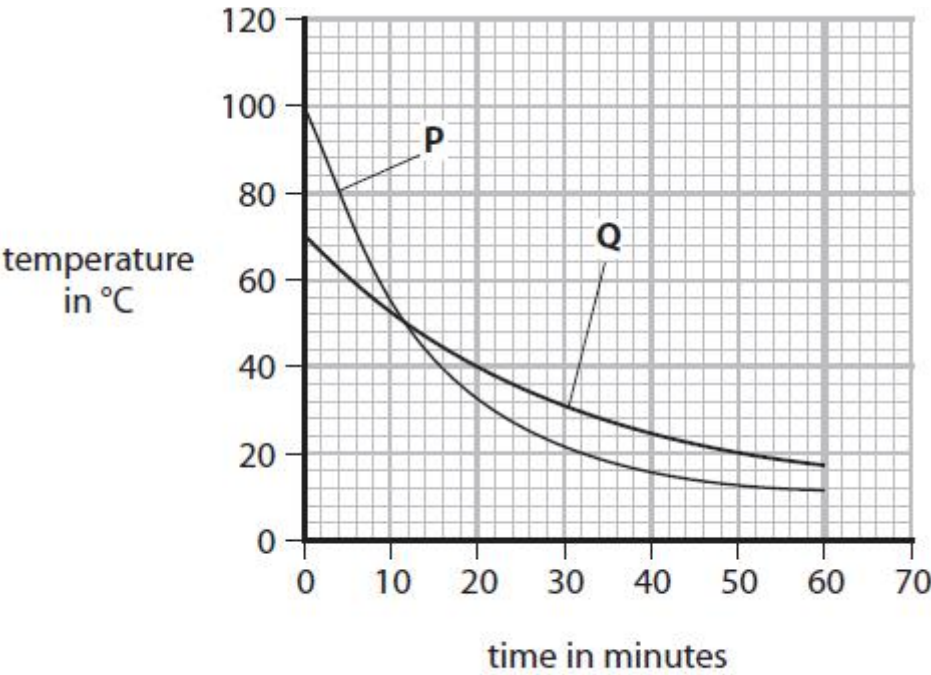


Figure 7

(i) Use the graph in Figure 7 to determine the time when **P** and **Q** were at the same temperature.

Show your working on the graph.

(2)

time = minutes

(ii) Which of these temperatures is most likely to be room temperature, as shown by the graph in Figure 7?

(1)

- ☒ **A** 100 °C
- ☒ **B** 70 °C
- ☒ **C** 10 °C

(iii) Explain why the curve for **P** is different from the curve of **Q**. Use information from Figure 6 and Figure 7 to help your answer.

(2)

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(Total for question = 5 marks)

Q5.

Figure 12 shows ray diagrams with objects placed at different distances from lenses.

(3)

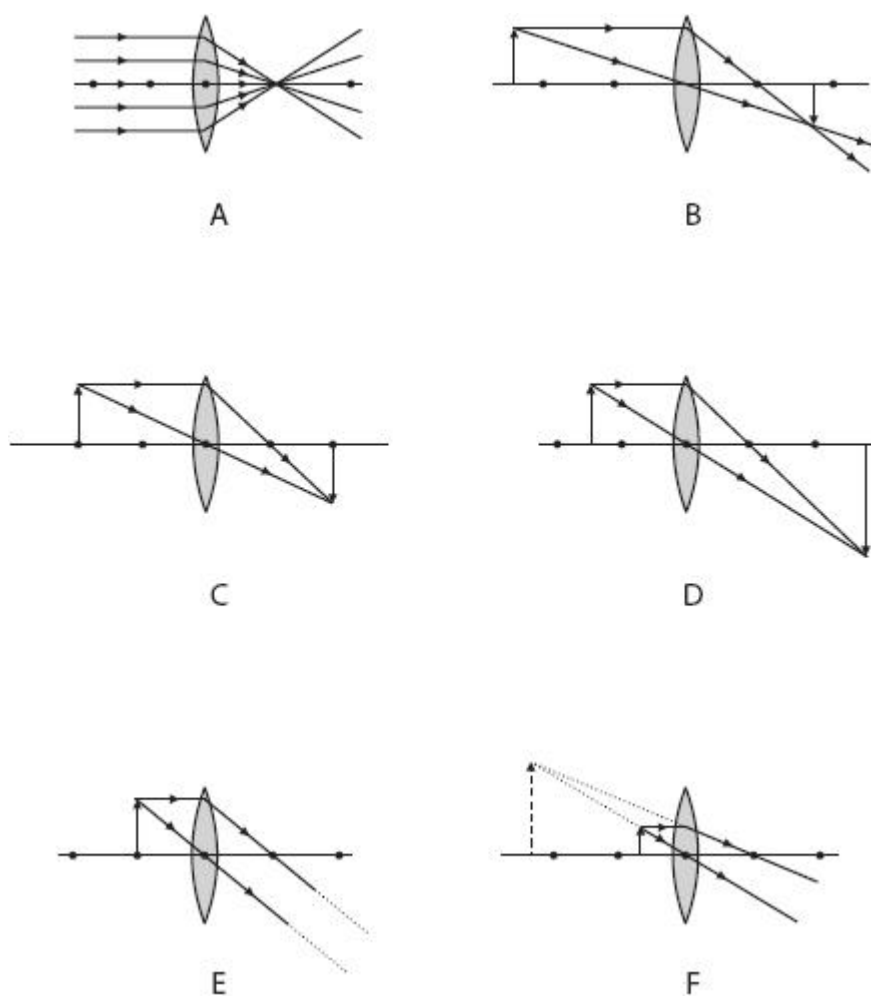


Figure 12

A student writes the conclusion:

'All lenses produce real images'.

Comment on the student's conclusion.

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(Total for question = 3 marks)