

SMART-EXAM-RESOURCES

**CAMBRIDGE LOWER SECONDARY CHECKPOINT
PRACTICE QUESTIONS AND MARK SCHEMES**

Subject: Physics TOPIC: Energy

Set-3

1 At the end of a long race, an athlete may be wrapped in a shiny foil blanket to prevent him cooling down too quickly.

Explain how the shiny foil blanket helps to reduce energy losses. Use ideas about conduction, convection and radiation in your answer.

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

MARK SCHEME:

shiny foil traps layer of air around body, stops convection ;

air is a good insulator / poor conductor ;

shiny foil is a poor radiator of heat ;

shiny foil reflects radiation back ;

heat can still escape by conduction ; [max 3]

2

Energy travels to the Earth from the Sun.

State whether this transfer of energy is by conduction, convection or radiation.

Explain your answer.

.....

.....

..... [2]

MARKING SCHEME:

radiation ;

(only) radiation can travel through vacuum/ conduction and convection need medium ; [2]

- 3 (a) Fig. 3.1 shows a potato being baked in the oven of an electric cooker.

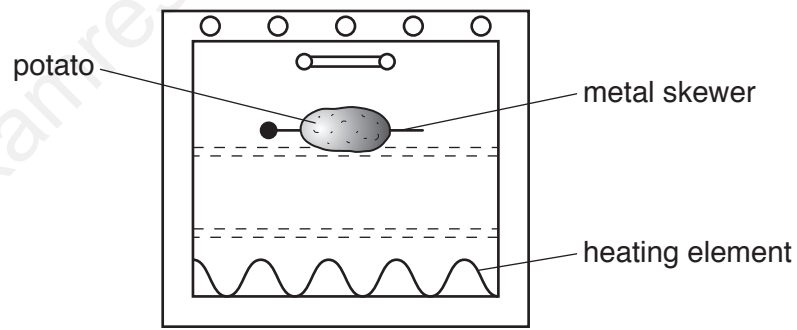


Fig. 3.1

The potato has a metal skewer (a long metal pin) pushed through it.

- (i) The air in the oven is heated by the heating element.

On Fig. 3.1 draw an arrow to show how the **heated** air moves inside the oven. [1]

- (ii) Name the main method of thermal energy transfer in the heated air.

..... [1]

- (iii) The metal skewer transfers heat to the inside of the potato by conduction.

Describe the process of conduction in a solid, using ideas about particle vibration.

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

MARKING SCHEME:

- (a)(i) arrow showing heated air rising ; [1]
(a)(ii) convection ; [1]
(a)(iii) particles vibrate more / gain energy ;
this vibration is passed through metal ;
[2]

- 4 Fig. 3.2 shows an iron rod being heated at one end by a Bunsen burner.

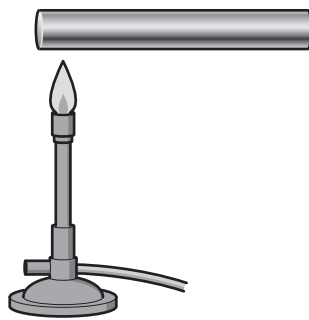


Fig. 3.2

Thermal energy passes through the rod by conduction.

- (i) Describe the process of conduction in solid iron, using ideas about the vibration of atoms.

.....

.....

.....

..... [2]

MARKING SCHEME:

(incident energy / energy gained, makes) atoms vibrate more ;
this vibration is passed through metal ;

[2]

5 Fig. 8.1 shows the inside of a refrigerator.

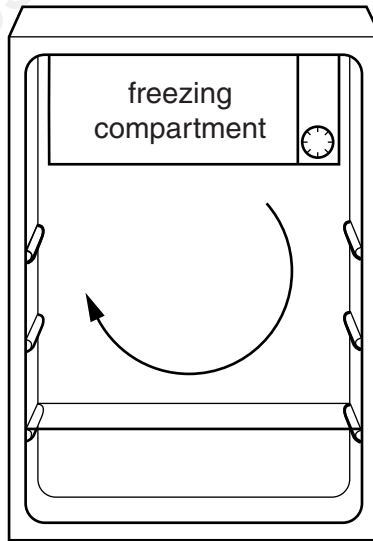


Fig. 8.1

(a) The air inside the refrigerator is cooled by convection.

The cold air moves downwards from the freezing compartment and displaces warm air which moves upwards.

Explain this movement in terms of particles.

.....

.....

.....[2]

MARKING SCHEME:

(a) particles move more slowly / have less energy ;
particles become closer together ;
gas becomes more dense ; [max 2]

6

Use the idea of convection to explain why a kettle has the heating element at the bottom.

.....

.....

..... [2]

MARKING SCHEME:

hot water rises/ cold water sinks ;
(because) hot water is less dense/ cold water is more dense ; [2]