Rewarding Learning

Centre Number

Candidate Number

General Certificate of Secondary Education
2019

Double Award Science: Physics

Unit P2

Foundation Tier

[GDW61]

GDW61

FRIDAY 14 JUNE, MORNING

TIME

1 hour 15 minutes.

INSTRUCTIONS TO CANDIDATES

Write your Centre Number and Candidate Number in the spaces provided at the top of this page.
You must answer the questions in the spaces provided.
Do not write outside the boxed area on each page or on blank pages.
Complete in black ink only. **Do not write with a gel pen.**
Answer **all nine** questions.

INFORMATION FOR CANDIDATES

The total mark for this paper is 70.
Figures in brackets printed down the right-hand side of pages indicate the marks awarded to each question or part question.
Quality of written communication will be assessed in Question **8**.

12299

1 **(a)** **(i)** Electromagnetic waves have certain properties. Place a tick (✓) in the box beside the statement below that describes **one** of these properties.

All electromagnetic waves have the same frequency in a vacuum. ☐

All electromagnetic waves have the same wavelength in a vacuum. ☐

All electromagnetic waves travel at the same speed in a vacuum. ☐

[1]

(ii) Insert the names of the missing electromagnetic waves in the correct positions in the diagram below.

Gamma rays			Visible light			Radio waves

Increasing wavelength

[4]

Overexposure to certain types of electromagnetic radiation can be harmful.

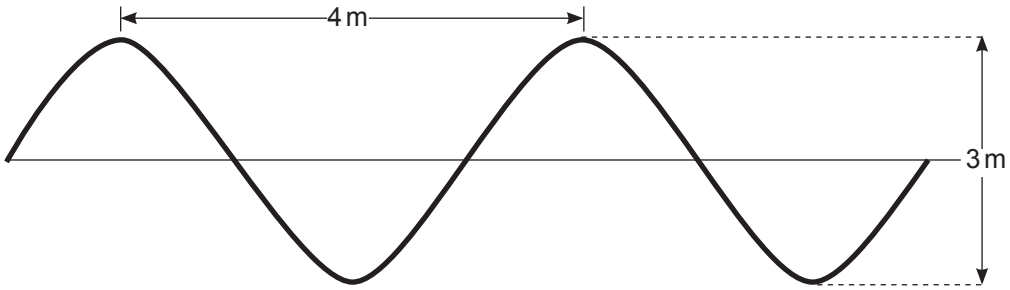
(b) **(i)** State a danger caused by overexposure to intense visible light.

_____ [1]

(ii) State a danger caused by overexposure to gamma rays.

_____ [1]

2 **(a)** The water wave shown below is a transverse wave.



(i) What does a water wave transfer?

_____ [1]

(ii) What is the wavelength of the water wave?

_____ m [1]

(iii) What is the amplitude of the water wave?

_____ m [1]

(b) **(i)** Give another example of a transverse wave.
Describe how the particles move in such a wave.

Example _____

How particles move _____

_____

_____ [3]

(ii) Give an example of a longitudinal wave.

_____ [1]

[Turn over

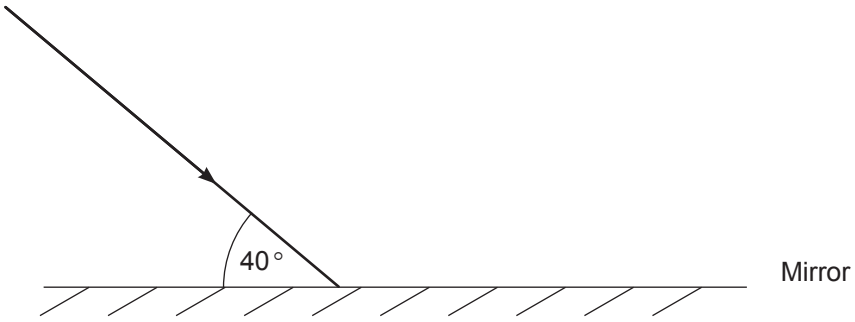
3 The diagram below shows a ray of light incident on a plane mirror.

(a) Complete the diagram to show the reflected ray. In your diagram you should:

(i) draw the normal and label it with an **N**; [1]

(ii) draw the reflected ray; [1]

(iii) insert an arrow on the reflected ray to show the direction of travel. [1]

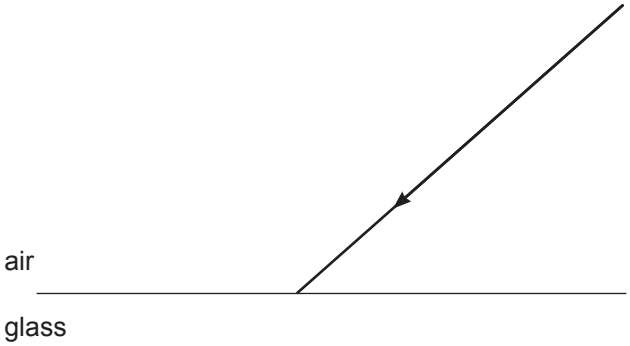


(iv) What is the size of the angle of incidence in the diagram above?

_____ ° [1]

When light enters glass it changes direction.

(b) (i) Complete the diagram below to show the path of the light in the glass.



[2]

(ii) What name do we give to this process?

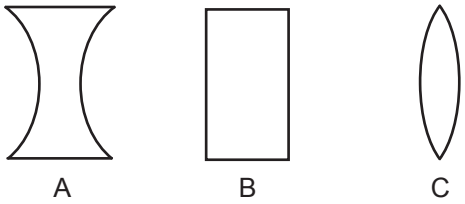
_____ [1]

(iii) How does the speed of the light change, if at all, as it enters the glass?

Circle the correct answer.

speed increases speed decreases speed does not change [1]

4 The shapes of three pieces of glass are shown below.

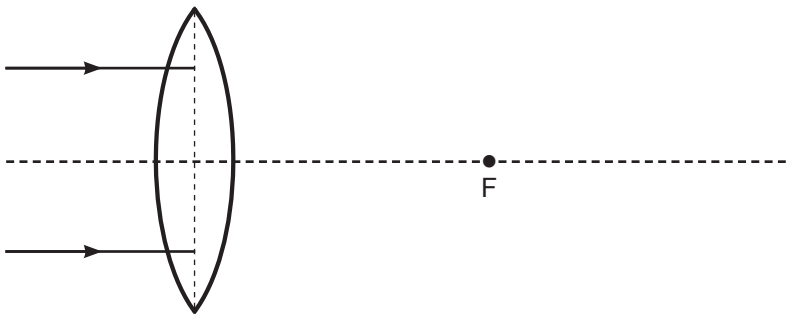


(a) **(i)** Which shape, A, B or C, is a converging lens? _____ [1]

(ii) Which shape, A, B or C, is a diverging lens? _____ [1]

The diagram below shows two parallel light rays entering a lens.

(b) Complete the diagram to show what happens to the two light rays as they pass through the lens. F is the focal point.



[3]

If you were asked to find the focal length of a lens in the classroom, you would form an image of a distant object.

(c) Other than the lens and the distant object, what other two pieces of apparatus would you use to find the focal length of the lens?

1. _____

2. _____ [2]

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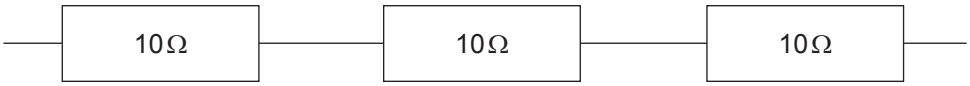
(Questions continue overleaf)

5 Each of the resistors below has a resistance of 10 Ω.

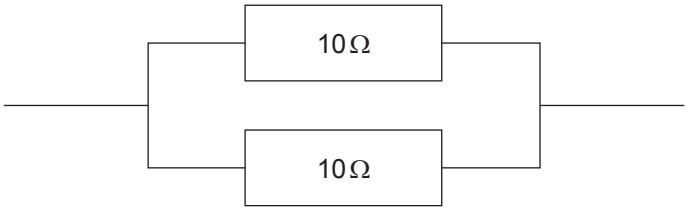
(a) What is the total resistance in the resistor combinations shown below?

(i)



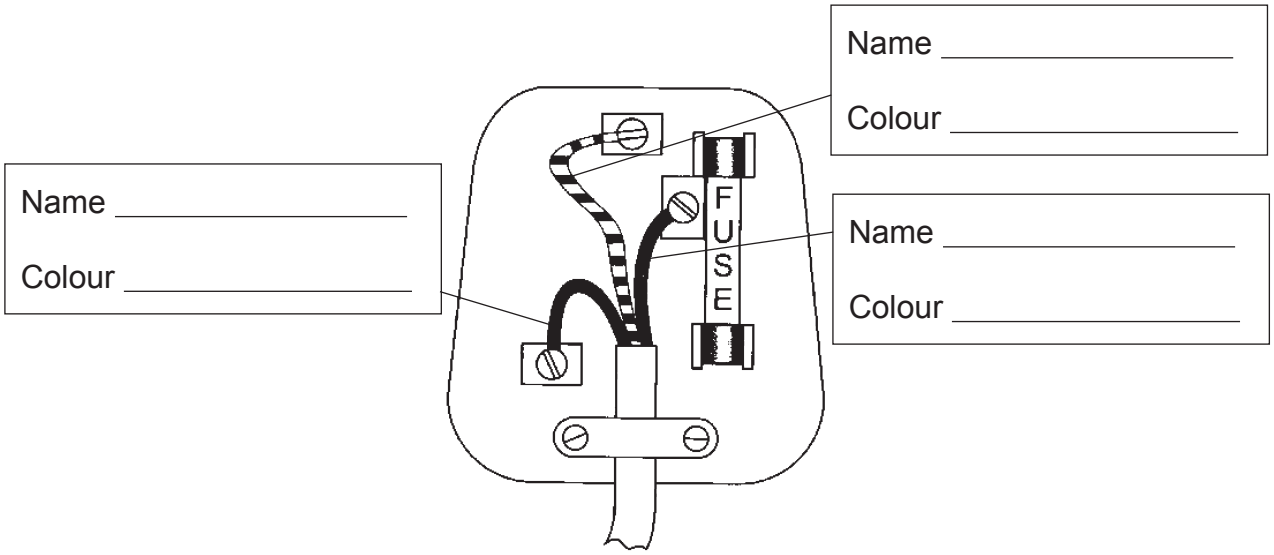
Total resistance = _____ Ω [1]

(ii)



Total resistance = _____ Ω [1]

(b) Label the diagram of a plug with the correct name and colour for each wire.



[6]

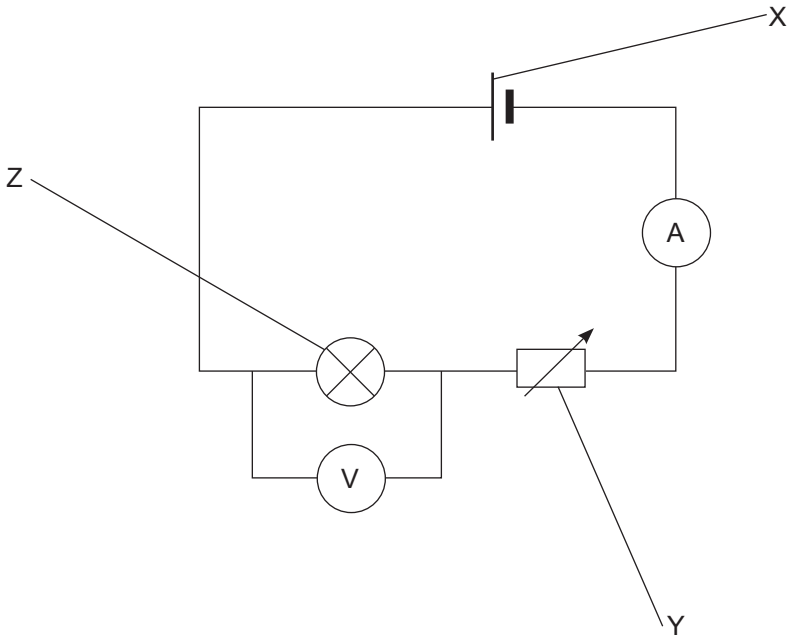
[Turn over

6 **(a)** **(i)** What is an electric current?

_____

_____ [1]

In the circuit below there are five components.



(ii) Label the components X, Y and Z.

X = _____

Y = _____

Z = _____ [3]

(b) Kate spends 30 minutes cutting the grass in her garden with an electric lawnmower which uses a current of 5 A. Calculate the total charge which flows during this time.

Include the unit with your answer.

You are advised to show your working out.

Charge = _____ [5]

7 **(a)** When a current travels through a wire, electrical energy is changed into other forms.

Give the main energy form that is produced and describe how it is produced.

Energy form _____

How it is produced _____

_____

_____ [3]

(b) **(i)** A 345 W food mixer is connected to a 230 V mains supply.

Calculate the current flowing through it.

You are advised to show your working out.

Current = _____ A [3]

(ii) Choose a suitable fuse for the food mixer from the following:

1 A **3 A** **5 A**

Circle the correct answer. [1]

(c) Bread is placed in a 1.2 kW toaster for 90 seconds. How much energy does the toaster use?

You are advised to show your working out.

Energy = _____ J [4]

8 The Solar System consists of many objects including planets. Some of these objects orbit the Sun.

Describe the main features of the Solar System.

In this question you will be assessed on the quality of your written communication skills including the use of specialist scientific terms.

Your answer should include:

the list of planets in order from the Sun;

_____

_____

_____

the name of one rocky planet;

_____

the name of one gas planet;

_____

the name of a body which orbits a planet other than an artificial satellite;

_____

the name of the force which provides orbital motion in the Solar System.

_____ [6]

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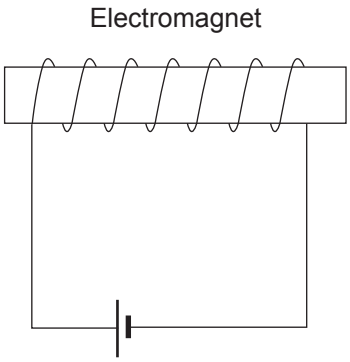
(Questions continue overleaf)

9 An electromagnet can be made using a coil of wire and a power supply.



(a) (i) Describe three ways to increase the strength of the electromagnet.

_____

_____

_____ [3]

The direction of current in the coil is reversed.

(ii) Tick (✓) the correct box below to describe what happens.

☐ The north and south poles are reversed.

☐ The magnetic field becomes stronger.

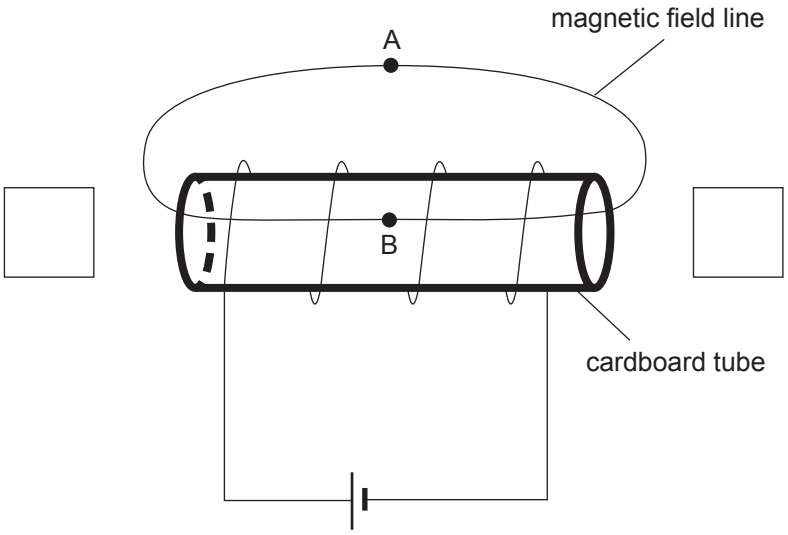
☐ The magnetic field becomes weaker. [1]

(b) The diagram shows a current-carrying coil wrapped around a cardboard tube.

One magnetic field line is shown.

Complete the diagram:

- Show the north and south poles in the boxes provided;
- Indicate with arrows the direction of the magnetic field line at A and B.



[3]

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For Examiner's use only	
Question Number	Marks
1	
2	
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