



*Rewarding Learning*

General Certificate of Secondary Education  
2019

Centre Number

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Candidate Number

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# 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.



- 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.

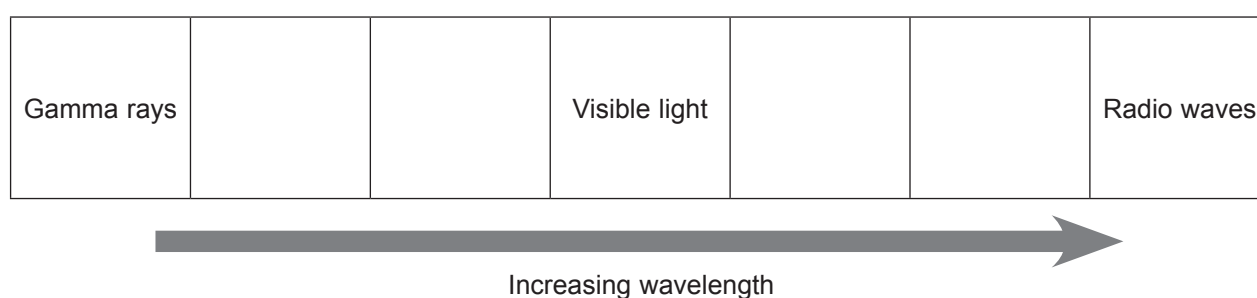
☐

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.



[4]

Overexposure to certain types of electromagnetic radiation can be harmful.

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

\_\_\_\_\_

[1]

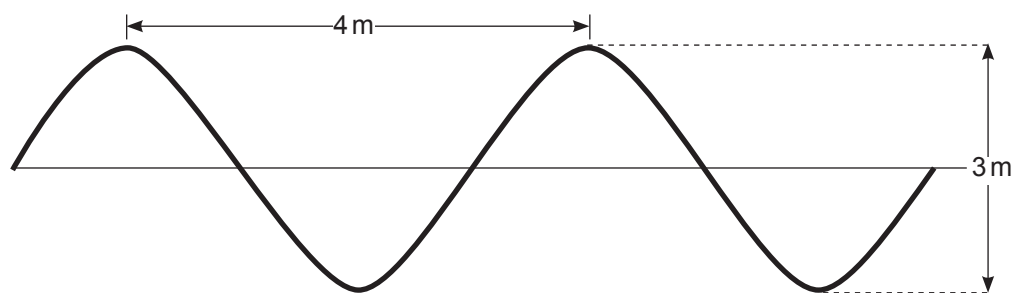
- (ii) State a danger caused by overexposure to gamma rays.

\_\_\_\_\_

[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



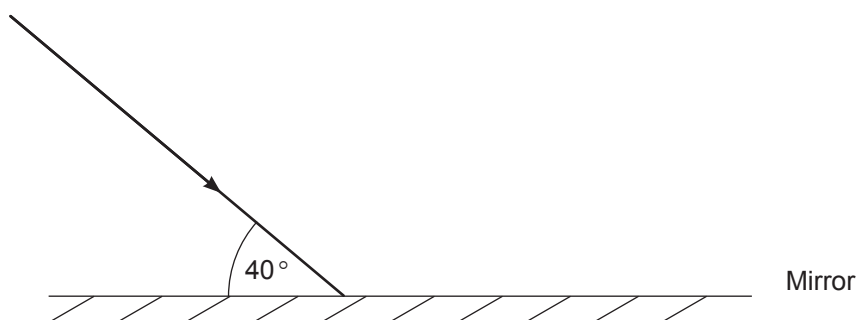
3 The diagram below shows a ray of light incident on a plane mirror.

(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]



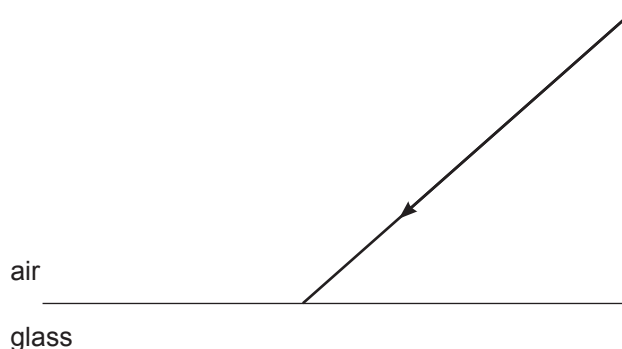
(iv) What is the size of the angle of incidence in the diagram above?

\_\_\_\_\_ ° [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

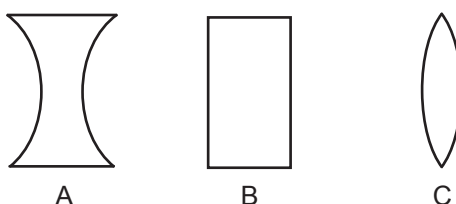
speed does not change

[1]

[Turn over]



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

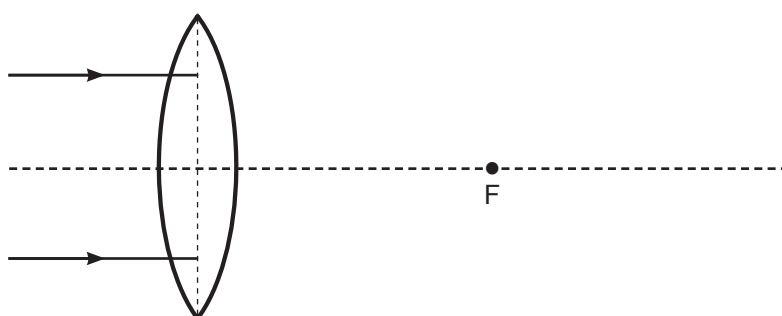


(a) (i) Which shape, A, B or C, is a converging lens? \_\_\_\_\_ [1]

(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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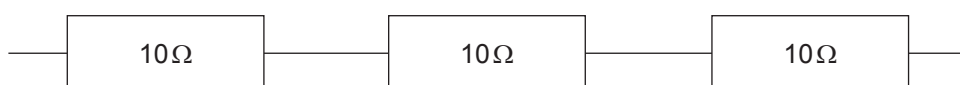
**(Questions continue overleaf)**



5 Each of the resistors below has a resistance of  $10\Omega$ .

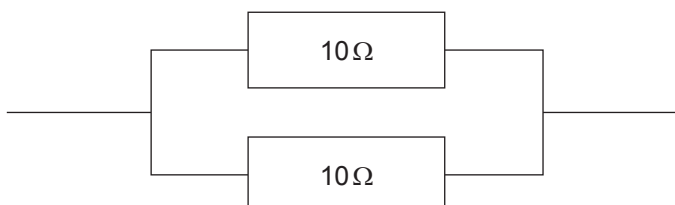
(a) What is the total resistance in the resistor combinations shown below?

(i)



Total resistance = \_\_\_\_\_  $\Omega$  [1]

(ii)

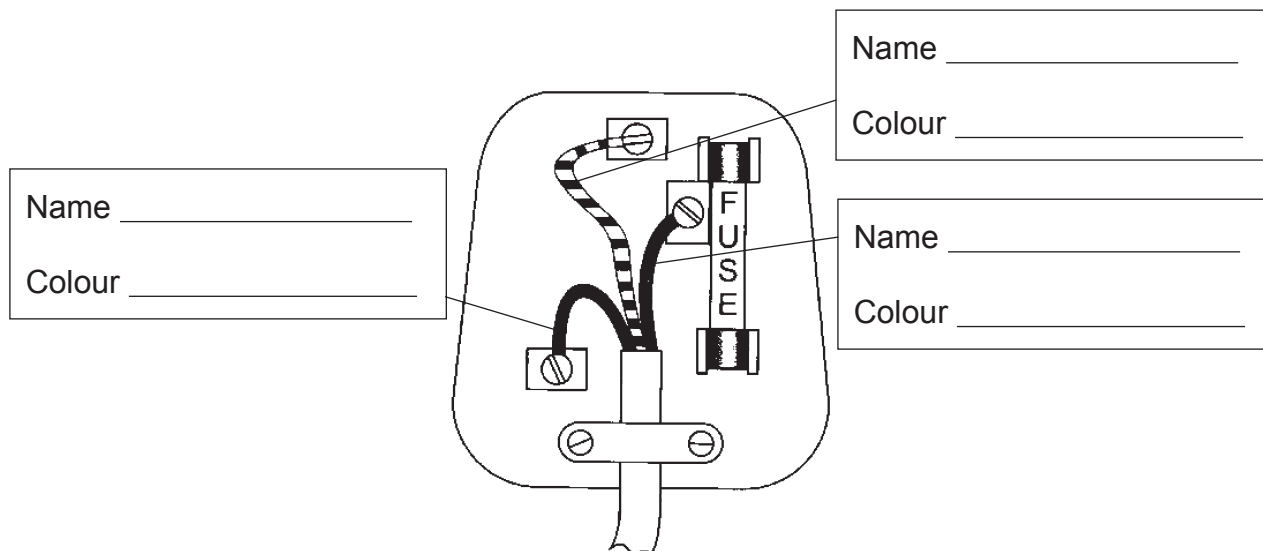


Total resistance = \_\_\_\_\_  $\Omega$  [1]





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



[6]

[Turn over]



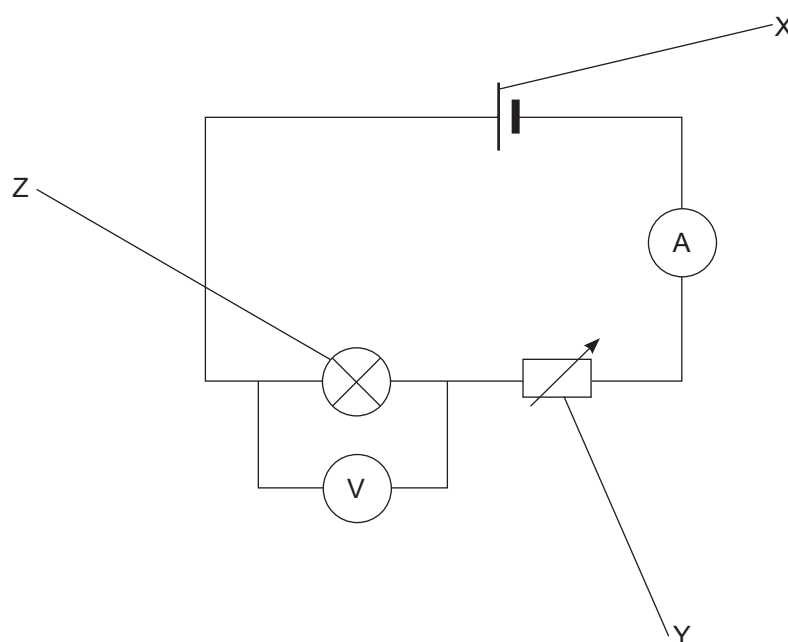
6 (a) (i) What is an electric current?

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[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]

[Turn over]



- 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;

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the name of one rocky planet;

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the name of one gas planet;

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

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

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[6]





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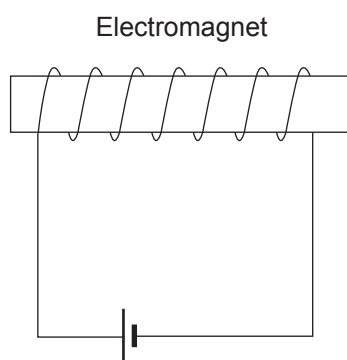
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**[Turn over**



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- 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.

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[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]



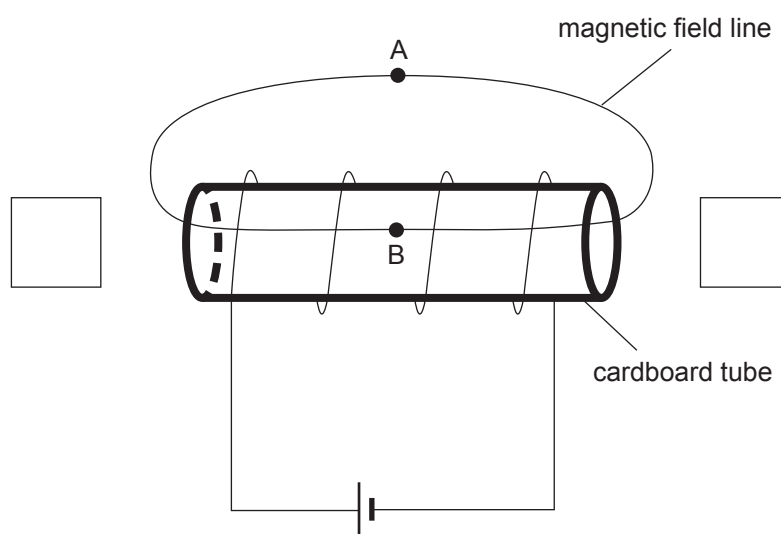


(b) The diagram shows a current-carrying coil wrapped around a cardboard tube.

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 |       |
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| Question Number         | Marks |
| 1                       |       |
| 2                       |       |
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Examiner Number

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