



General Certificate of Secondary Education
2018–2019

Centre Number

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Candidate Number

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Double Award Science: Physics

Unit P1
Foundation Tier

[GDW31]

FRIDAY 9 NOVEMBER 2018, MORNING



TIME

1 hour.

INSTRUCTIONS TO CANDIDATES

Write your Centre Number and Candidate Number in the spaces provided at the top of this page.

Write your answers in the spaces provided in this question paper.
Answer **all nine** questions.

INFORMATION FOR CANDIDATES

The total mark for this paper is 60.

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 **7(a)**.

For Examiner's use only	
Question Number	Marks
1	
2	
3	
4	
5	
6	
7	
8	
9	
Total Marks	

- 1 (a) Energy can exist in many forms.
Circle the **three** energy forms in the box below.

<i>chemical</i>	<i>density</i>	<i>gravitational potential</i>
<i>force</i>	<i>light</i>	<i>pressure</i>

[3]

- (b) In the kitchen energy transfers take place when using electrical equipment. In the examples below state the energy form the device has been **designed** to produce.
An example has been done for you.



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Electrical to _____ *heat* _____

- (i) Radio



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Electrical to _____ [1]

- (ii) Kettle



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Electrical to _____ [1]

- (iii) Food mixer



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Electrical to _____ [1]

Examiner Only	
Marks	Remark
○	○

2 Energy resources may be described as renewable or non-renewable.

(a) (i) Describe what is meant by a renewable energy resource.

_____ [1]

(ii) In the table below put an R beside the energy resources which are renewable and N beside those which are non-renewable. One entry has been completed for you.

Resource	Renewable (R) or Non-renewable (N)
Coal	N
Gas	
Nuclear	
Sunlight	
Wind	

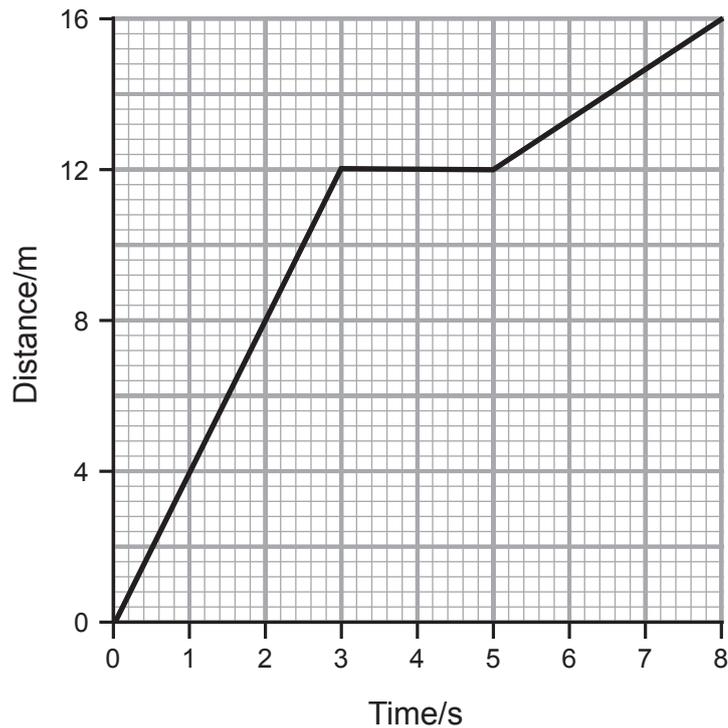
[4]

(b) A farmer places wind turbines close to houses. State one way this could affect the environment.

_____ [1]

Examiner Only	
Marks	Remark
○	○

- 3 The graph below represents the motion of a toy car as it moves across the floor.



- (i) How far does the car travel in the first 3 seconds of its motion?

_____ m [1]

- (ii) Describe what is happening to the car between $t = 3$ seconds and $t = 5$ seconds.

_____ [1]

- (iii) Calculate the average speed of the car over the whole 8 second journey.

You are advised to show your working out.

Average speed = _____ m/s [3]

Examiner Only	
Marks	Remark
○	○

- 4 The picture below represents a tug of war. The team members are exerting different forces.



© Rawpixel / iStock / Thinkstock

- (a) Write the value of the resultant force and state its direction.

Resultant force = _____ N, Direction = _____ [2]

- (b) In a tug of war between two contestants one of them is pulled forward by a resultant force of 180 N. If he has a mass of 60 kg, calculate his acceleration. Include the unit with your answer.

You are advised to show your working out.

Acceleration = _____ [4]

Examiner Only	
Marks	Remark
○	○

A ballet dancer's weight is shared equally between her left and right foot.



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(b) (i) Select the correct statement below by ticking (✓) the box.

The pressure on both feet is the same.

The dancer's left foot exerts a bigger pressure.

The dancer's right foot exerts a bigger pressure.

[1]

(ii) Explain the reason for your choice.

_____ [1]

Examiner Only

Marks Remark

- 6 The incomplete table below shows some of the results in a spring investigation.

(a) Complete the table by entering the missing values.

Force/N	10.5	21.0	31.5		52.5
Extension/cm	2		6	8	10

[2]

- (b) (i) In the space below write the equation which relates the force, F , and the extension, e , of a spring.

_____ [1]

The spring in a toy extends by 10 cm when a force of 5 N is applied.

- (ii) Calculate the value of the spring constant.
Include the unit with your answer.

You are advised to show your working out.

Spring constant = _____ Unit _____ [3]

Examiner Only	
Marks	Remark
○	○

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(Questions continue overleaf)

7 A piece of jewellery, of irregular shape, is made from a certain type of metal.

(a) Describe an experiment you would carry out to find the density of the metal.

In your description you should include the following:

- the measuring instruments you will use and the measurements you will take;
- the equation for density;
- a precaution you will take to ensure accuracy; and
- what you will do to ensure reliability.

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

Measuring instruments and measurements: _____

The equation for density: _____

Precaution: _____

Reliability: _____

_____ [6]

Examiner Only	
Marks	Remark
○	○

(b) (i) Which of the three materials below will have the largest density?

gold

air

water

_____ [1]

(ii) Give a reason for your choice in terms of the distance between the particles.

_____ [1]

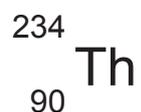
Examiner Only	
Marks	Remark

- 8 (a) The table below contains some information about the three particles which make up an atom.
Complete the table.

Particle	Relative mass	Location
Neutron		
		Nucleus
	$\frac{1}{1840}$	

[6]

- (b) The thorium (Th) nucleus is represented below.



State the number of positively charged particles in the nucleus.

State the number of negatively charged particles in the nucleus.

State the number of uncharged particles in the nucleus.

_____ [3]

Examiner Only	
Marks	Remark
○	○

9 (a) (i) Why do some nuclei disintegrate?

_____ [1]

(ii) When a radioactive nucleus disintegrates it can emit any one of three types of radiation. List the three types below.

1. _____
2. _____
3. _____ [3]

(iii) One type of radiation emitted from a nucleus is an electromagnetic wave. State which type.

_____ [1]

One way of producing energy involves the splitting of a heavy nucleus.

(b) (i) What is the name of this process?

_____ [1]

(ii) Before the heavy nucleus can split it must absorb a particle. Name the particle.

_____ [1]

(iii) Name a nuclear fuel used for this process.

_____ [1]

(iv) Name the particle which sustains the chain reaction.

_____ [1]

THIS IS THE END OF THE QUESTION PAPER

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Marks	Remark
○	○

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