

Please write clearly in block capitals.

Centre number

--	--	--	--	--

Candidate number

--	--	--	--

Surname

Forename(s)

Candidate signature

ELC SCIENCE

Externally-Set Assignment

Component 5 Physics: Energy, forces and the structure of matter

Set 1 (valid from September 2016)

Certification from 2017

Time allowed: 45 minutes

Materials

For this paper you must have:

- a ruler
- a calculator.

Instructions

- Use black ink or black ball-point pen. Pencil should only be used for drawing.
- Fill in the boxes at the top of this page.
- Answer **all** questions in the spaces provided.
- Do all rough work in this book. Cross through any work you do not want to be marked.

Information

- The maximum mark for this paper is 20.
- The marks for questions are shown in brackets.

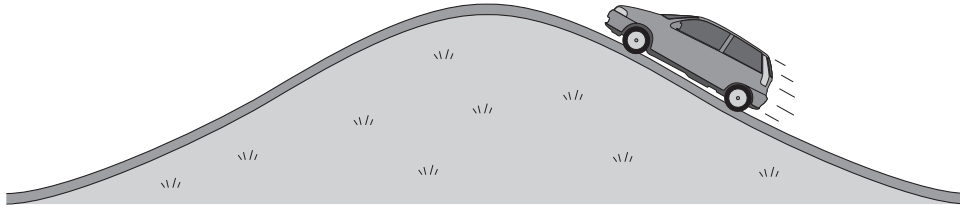
For Examiner's Use	
Examiner's Initials	
Question	Mark
1	
2	
3	
4	
5	
6	
TOTAL	



Answer **all** questions in the spaces provided.

- 1** **Figure 1** shows a car being driven to the top of the hill.

Figure 1



- 1 (a)** Use the correct answer from the box to complete the sentence.

[1 mark]
Outcome 1

elastic potential gravitational potential kinetic

As the car starts to move, the car's engine transfers chemical energy in the petrol into
_____ energy.



- 1 (b)** Use the correct answer from the box to complete the sentence.

[1 mark]
Outcome 1

elastic potential	gravitational potential	kinetic
-------------------	-------------------------	---------

The car builds up _____ energy as it goes up the hill.

- 1 (c)** Name **one** unwanted energy transfer that takes place in the car's engine.

[1 mark]
Outcome 2

3

Turn over for the next question

Turn over ►



2 There are many energy resources used on Earth. One of these resources is oil.

2 (a) Oil is a fossil fuel. Name **two other** fossil fuels.

[2 marks]
Outcome 3

1 _____

2 _____

2 (b) What type of energy resource are fossil fuels?

[1 mark]
Outcome 3

2 (c) How are wind, geothermal and solar energy different to fossil fuels?

[1 mark]
Outcome 3



3 When two objects interact a force is produced.

3 (a) What is a force?

[1 mark]
Outcome 4

3 (b) Tick (✓) **one** box for **each** statement to show if it is true or false. One has been done for you.

[2 marks]
Outcome 5

Statement	True	False
Forces act on an object because of an interaction with another object.	✓	
Work is done when a force causes an object to move.		
Working against friction causes a drop in temperature.		

3

Turn over for the next question

Turn over ►



- 4 **Figure 2** shows people training for a race.

Figure 2



They know that: $\text{speed} = \frac{\text{distance}}{\text{time}}$

- 4 (a) They run 20 km in 2 hours. What is their speed?

[1 mark]
Outcome 6

_____ km/hour

- 4 (b) They run 210 m in 30 seconds. What is their speed? Give the unit.

[1 mark]
Outcome 6

- 4 (c) A dog runs out in front of the runners. The runners need to react quickly.

What is a typical reaction time for a person?

Draw a ring around the correct answer.

[1 mark]
Outcome 8

0.1 seconds

0.5 seconds

1.5 seconds



5 Cars sometimes have to stop in an emergency.

5 (a) Draw **one** line from **each** statement to its meaning. One has been done for you.

[2 marks]
Outcome 7

Statement	Meaning
The force between the tyres and the road	The distance the car travels before the driver realises she needs to brake
Stopping distance	The total distance travelled
Braking distance	The distance the car travels after the driver has braked
Thinking distance	Friction

5 (b) Name **one** factor that will **increase** the braking distance.

[1 mark]
Outcome 9

5 (c) Name **one** factor that will **increase** the driver's reaction time.

[1 mark]
Outcome 8

4

Turn over for the next question

Turn over ►



6 Three types of radiation can come from radioactive decay.

These are:

- alpha particles
- beta particles
- gamma rays.

6 (a) Use **each** of these types of radiation to complete the table.

[2 marks]
Outcome 10

Type of radiation	Range in air	Stopped by
	10–15 cm	thin aluminium
	a few centimetres	paper
	many metres	very thick lead or concrete

6 (b) Give **one** use of gamma radiation.

[1 mark]
Outcome 10

3

END OF QUESTIONS

Copyright information

For confidentiality purposes, from the November 2015 examination series, acknowledgements of third party copyright material will be published in a separate booklet rather than including them on the examination paper or support materials. This booklet is published after each examination series and is available for free download from www.aqa.org.uk after the live examination series.

Permission to reproduce all copyright material has been applied for. In some cases, efforts to contact copyright-holders may have been unsuccessful and AQA will be happy to rectify any omissions of acknowledgements. If you have any queries please contact the Copyright Team, AQA, Stag Hill House, Guildford, GU2 7XJ.

Copyright © 2016 AQA and its licensors. All rights reserved.

