



Surname _____

Other Names _____

Centre Number _____

Candidate Number _____

Candidate Signature _____

I declare this is my own work.

Level 3 Certificate/Extended Certificate

APPLIED SCIENCE

Unit 1 Key Concepts in Science
Section C – Physics

ASC1/P

Time allowed: 1 hour 30 minutes. You are advised to spend approximately 30 minutes on this section.

At the top of the page, write your surname and other names, your centre number, your candidate number and add your signature.

[Turn over]



For this paper you must have:

- **a calculator**
- **the Formulae Sheet (enclosed).**

INSTRUCTIONS

- **Use black ink or black ball-point pen.**
- **Answer ALL questions in each section.**
- **You must answer the questions in the spaces provided. Do not write on blank pages.**
- **If you need extra space for your answer(s), use the lined pages at the end of this book. Write the question number against your answer(s).**
- **Do all rough work in this book. Cross through any work you do not want to be marked.**



INFORMATION

- You will be provided with a copy of the Formulae Sheet.
- There are three sections in this paper:
SECTION A – Biology SECTION B – Chemistry
SECTION C – Physics.
- The marks for questions are shown in brackets.
- The maximum mark for this paper is 60 and the maximum mark for this section is 20.

ADVICE

Read each question carefully.

DO NOT TURN OVER UNTIL TOLD TO DO SO



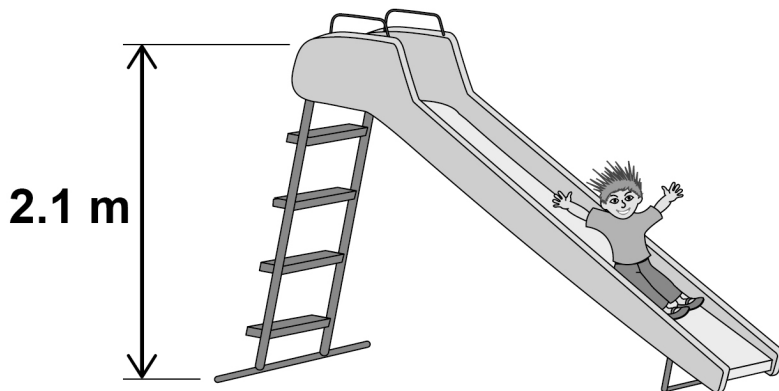
SECTION C – PHYSICS

Answer ALL the questions in this section.

0	1
---	---

FIGURE 1 shows a child going down a slide.

FIGURE 1



The child has a mass of 21 kg.

The child's speed is 3.4 m s^{-1} at the bottom of the slide.

0	1	.	1
---	---	---	---

Calculate the gravitational potential energy of the child at the top of the slide.

Assume $g = 9.8 \text{ m s}^{-2}$

Use information from FIGURE 1.

Use the Formulae Sheet. [1 mark]

Gravitational potential energy = _____ J

[Turn over]



0	1	.	2
---	---	---	---

The child's speed is 3.4 m s^{-1} at the bottom of the slide.

Calculate the child's kinetic energy at the bottom of the slide.

Use the Formulae Sheet. [1 mark]

Kinetic energy = _____ J



The child is at rest at the top of the slide.

The child's speed is 3.4 m s^{-1} at the bottom of the slide.

0 1 . 3

The child accelerates with a constant acceleration of 1.1 m s^{-2} down the slide.

Calculate the length of the slide.

Use the Formulae Sheet. [2 marks]

Length of slide = _____ m

[Turn over]



0	1	.	4
---	---	---	---

Describe how the momentum of the child changes from the top of the slide to the bottom of the slide. [2 marks]

0	1	.	5
---	---	---	---

Explain why Newton's First Law of Motion does NOT apply when the child goes down the slide. [2 marks]



0	1	.	6
---	---	---	---

The child sits on a coat and goes down the slide again.

The speed of the child is faster than 3.4 m s^{-1} at the bottom of the slide.

Explain what effect sitting on the coat has on the efficiency of the slide. [3 marks]

[Turn over]

11



02

A set of garden lights uses solar power.

The garden lights have a battery that is charged by light from the Sun.

02.1

Solar power is a renewable energy source.

TABLE 1 shows a list of other energy sources.

Tick (✓) all the RENEWABLE energy sources in TABLE 1. [1 mark]

TABLE 1

Energy source	Tick (✓)
Fossil fuels	
Hydroelectric power	
Nuclear fuels	
Tidal power	
Wave power	
Wind power	

0	2	.	2
---	---	---	---

One advantage of solar power is that it is a renewable energy source.

Give ONE other advantage and ONE disadvantage of using solar power for the garden lights. [2 marks]

Advantage _____

Disadvantage _____

[Turn over]



0	2	.	3
---	---	---	---

The battery is charged by an average current of 0.075 A for 8 hours.

Calculate the total charge flow while the battery is charged.

Give the unit.

Use the Formulae Sheet. [3 marks]

Charge = _____ Unit _____



BLANK PAGE

[Turn over]

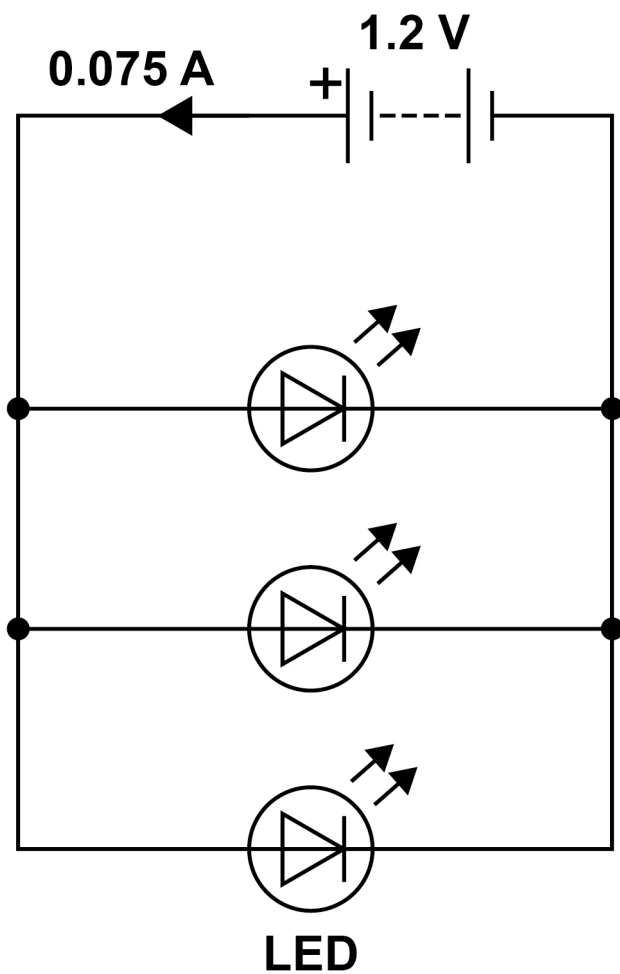


0	2	.	4
---	---	---	---

The garden lights consist of three **IDENTICAL** light-emitting diodes (LEDs) connected to a battery.

FIGURE 2 shows the circuit diagram for the garden lights.

FIGURE 2



**Give the voltage and the current for each LED.
[2 marks]**

Voltage = _____ V

Current = _____ A

0 2 . 5

A SERIES circuit is NOT used for the garden lights.

Give ONE reason why a SERIES circuit is NOT used for the garden lights. [1 mark]

END OF QUESTIONS

9



Additional page, if required.

Write the question numbers in the left-hand margin.

[illegible]

Additional page, if required.

Write the question numbers in the left-hand margin.

[illegible]

BLANK PAGE

For Examiner's Use	
Question	Mark
1	
2	
TOTAL	

Copyright information

For confidentiality purposes, all acknowledgements of third-party copyright material are published in a separate booklet. This booklet is published after each live examination series and is available for free download from www.aqa.org.uk.

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.

Copyright © 2022 AQA and its licensors. All rights reserved.

IB/M/CD/Jan22/ASC1/P/E1