

GCSE

ADDITIONAL APPLIED SCIENCE A

AP6 Materials and Performance

Specimen Paper

Candidates answer on the question paper:

Additional materials: ruler (cm/mm), calculator

F **A336/01**
45 mins

Candidate
Name

--

Centre
Number

--	--	--	--	--

Candidate
Number

--	--	--	--

TIME 45 mins

INSTRUCTIONS TO CANDIDATES

- Write your name, centre number and candidate number in the boxes above.
- Answer **all** the questions.
- Write your answers on the dotted lines unless the question says otherwise.
- Use blue or black ink. Pencil may be used for graphs and diagrams only.
- Read each question carefully and make sure you know what you have to do before starting your answer.
- There is a space after most questions. Use it to do your working. In many questions marks will be given for a correct method even if the answer is incorrect.
- Do not write in the bar code. Do not write in the grey area between the pages.
- **DO NOT WRITE IN THE AREA OUTSIDE THE BOX BORDERING EACH PAGE. ANY WRITING IN THIS AREA WILL NOT BE MARKED.**

INFORMATION FOR CANDIDATES

- The number of marks is given in brackets [] at the end of each question or part question.
- The total number of marks for this paper is **36**.

This specimen paper consists of 18 printed pages.

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Answer all questions.

1. This question is about electric circuits.

Jennie's granddad builds her a doll's house for Christmas.

He wants to include lighting.

The symbols for three of the components are shown in the table.

- (a) Finish the table by writing the **name** of each component.

Choose from this list.

ammeter




cell

lamp

LDR

switch

variable

Symbol	Name of component
	
	
	

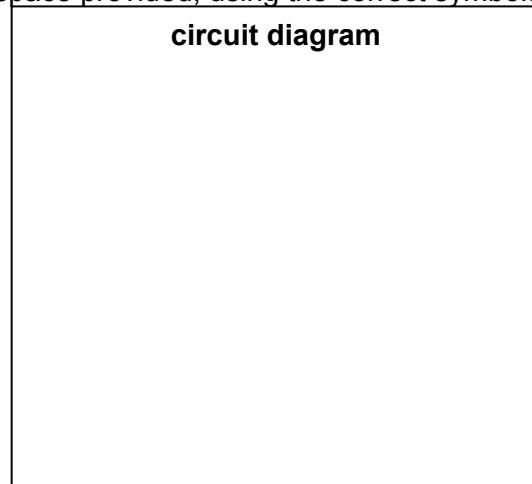
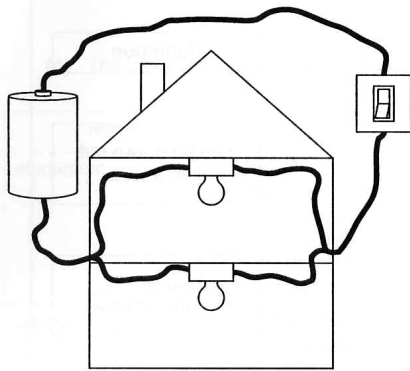
[3]

- (b) Jennie's granddad uses a cell, two lamps, a switch and some wires to light the doll's house.

The picture shows his circuit. Both lamps light up brightly.

- (i) Draw the circuit diagram in the space provided, using the correct symbols.
Label each part.

- (i) Draw the **circuit diagram** in the space provided, using the correct symbols.



[3]

- (ii) Jennie's granddad wants to do two more things to the circuit.
He includes a component to measure the current in the circuit.
He includes a component to measure the brightness of the lamp.
Complete the table below using words from the list.

ammeter
fixed resistor
fuse
switch
variable resistor
voltmeter

what it does	name of component
measures the current	
varies the brightness of the lamp	

[2]

[Total: 8]

2. Metals have many **physical properties** that make them suitable for everyday items, such as knives forks, saucepans and wire.

Below are two lists.

- (a) Match up each **physical property** to its **definition** by drawing a straight line between each pair.

One has been done for you.

physical property	definition
thermal conductivity	can be drawn out into a wire
ductility	how well it conducts heat
electrical conductivity	can be beaten into thin sheet without breaking
malleability	how well it conducts electricity
shiny	rings like a bell
	reflects light like a mirror

[4]

(b) You work for a company that makes saucepans.

(i) Which **one** of these physical properties is essential for saucepans?

.....[1]

(ii) Explain your answer.

.....
[1]

(c) The table shows some information about three metals.

metal	information
aluminium	tough very good thermal conductor low density corrodes very slowly quite expensive to produce lacks strength
copper	excellent thermal and electrical conductor corrodes very slowly low hardness value expensive to produce attractive appearance
iron	cheap to produce high hardness value brittle corrodes easily high density

Use the information in the table to answer the following questions.

(i) Wendy, a T.V. chef, uses copper saucepans.

Suggest **two** reasons for choosing copper.

.....
.....[2]

(ii) A school kitchen uses aluminium saucepans.

Suggest **two** reasons why they use aluminium rather than copper or iron.

.....
.....[2]

[Total: 10]

3.



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The woman in the picture is holding a piece of special window glass.

(a) Look at the photograph carefully.

Which would best describe this glass?

Put a ring around the correct answer.

opaque

translucent

transparent

[1]

(b) The glass has a heat reflective layer that becomes milky above a certain temperature.

The layer on the glass is called “intelligent”. This means that customers can have it designed so that it becomes milky at a temperature that they can select.

(i) Suggest and explain one situation where this glass could be used.

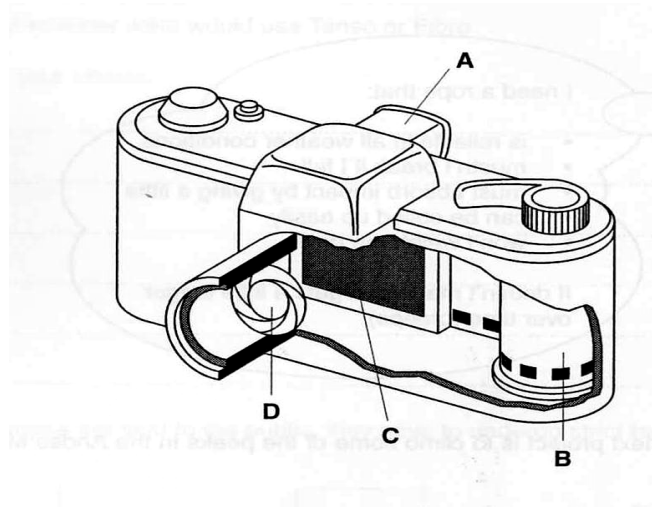
.....
.....[2]

(ii) Suggest and explain one situation where this glass should **not** be used.

.....
.....[2]

[Total: 5]

4. Below is a simplified diagram of a camera. The lens is missing.



- (a) On the diagram, draw the lens in its correct position.
- (b) Finish the table by writing the correct letter **A**, **B**, **C**, **D** next to the camera part.

part of camera	letter
aperture	
shutter	
viewfinder	

- (c) A **converging** lens is used inside a camera.
- (i) Explain why this type of lens is chosen. Use your ideas about how lenses work.

.....

.....

.....[2]

(ii) Write down **three** properties of the image produced with a converging lens.

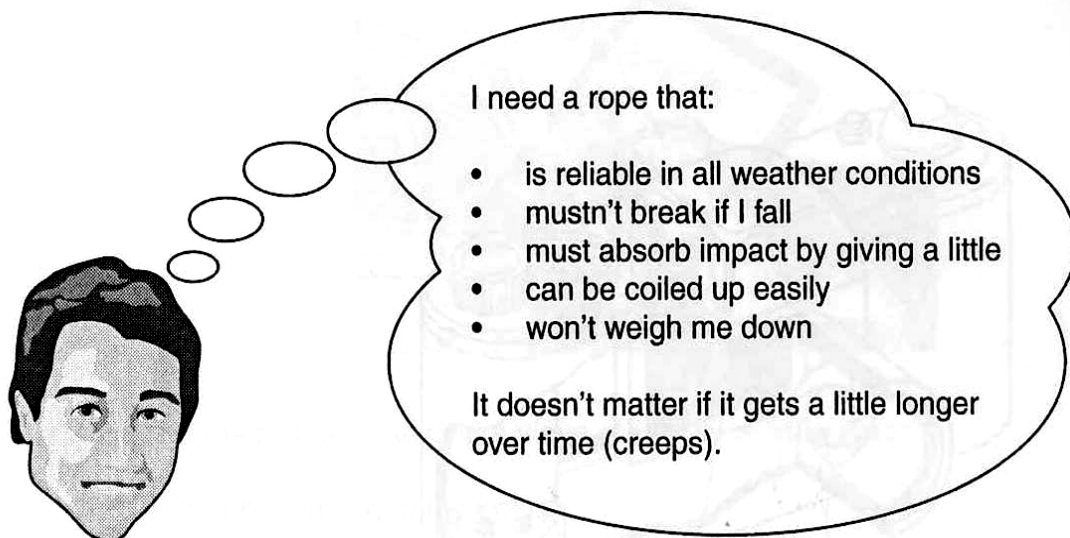
1

2

3[3]

[Total: 9]

5. Knott's Rope Company produces rope for all purposes.



John is a climber. His next project is to climb some of the peaks in the Andes Mountains of Peru.

In the table, you will find two of the company's rope products, Tenso and Fibro.

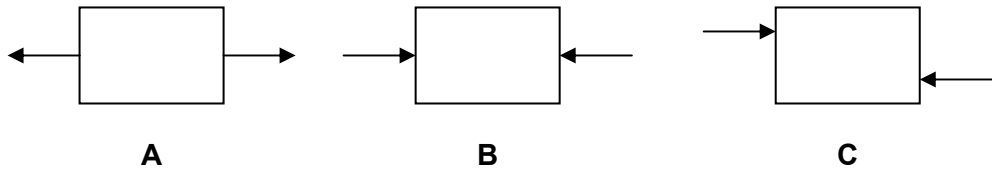
	Tenso	Fibro
strength	high	high
weight	medium	low
stretch behaviour	no elongation	slight elongation
flexibility	low	high
impact toughness	medium	high
creep resistance	high	low

- (a) Use John's statement and the table to help you with your answer.
 Suggest whether John would use Tenso or Fibro.
 Explain your choice.

.....

[3]

- (b) Before ropes are sold to the public, they have to undergo strict **tension** stress testing.



Which of the diagrams above show **tension** forces in a material?

Put a ring around the correct answer.

[1]

[Total: 4]

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GCSE

ADDITIONAL APPLIED SCIENCE A

AP6 Materials and Performance

Specimen Mark Scheme

Maximum mark for this paper is [36]

F **A336/01**
45 mins

This specimen mark scheme consists of 4 printed pages.

Question Number	Answer	Max Mark
<p>1(a)</p> <p>1(b)i</p> <p>1(b)</p>	<p>cell; lamp; switch;</p> <p>Correct symbols drawn for: (allow symbol for filament bulb) Lamps, cell, switch; Complete circuit; Connected in parallel;</p> <p>Ammeter; Variable resistor;</p> <p style="text-align: right;">Total marks</p>	<p>[1] [1] [1]</p> <p>[1] [1] [1] [1] [1]</p> <p>[8]</p>
<p>2(a)</p> <p>2(b)i</p> <p>2(b)ii</p> <p>2(c)i</p> <p>2(c)ii</p>	<p>Electrical conductivity---How well it conducts electricity; Thermal conductivity---How well it conducts heat; Ductility---Can be drawn into a wire; Shiny---reflects light like a mirror</p> <p>Thermal conductivity. (NOT malleability even if justified)</p> <p>So that the food becomes evenly heated/heated through properly/heated through quickly. (heat transfer for food must be clear)</p> <p>Any 2 from: Excellent thermal conductor, Corrodes very slowly, , Attractive appearance</p> <p>Any 2 from: Very good thermal conductor, Low density, Tough</p> <p style="text-align: right;">Total marks</p>	<p>[1] [1] [1] [1] [1]</p> <p>[1]</p> <p>[2]</p> <p>[2] [10]</p>
<p>3(a)</p> <p>3(b)i</p> <p>3(b)ii</p>	<p>Transparent</p> <p>Windows; Because it would stop rooms from getting too hot on a sunny day.</p> <p>Car windscreens, spectacles; It would prevent good visibility;</p> <p style="text-align: right;">Total marks</p>	<p>[1] [1] [1] [1] [1]</p> <p>[5]</p>

4(a)	Lens drawn in correct position;	[1]
4(b)	Aperture = D; Shutter = C; Viewfinder = A;	[1] [1] [1]
4(c)i	Bends/refracts the light; So that it focuses (on the film)	[1] [1]
4(c)ii	real; inverted/upside-down; diminished/smaller	[1] [1] [1]
	Total marks	[9]
5(a)	Any 3 from: It is more flexible; It is more lightweight; It has high impact toughness It elongates/stretch (slightly)	[3] [1]
5(b)	A	[4]
	Total marks	[4]
	Overall marks	[36]

Question	Spec Reference	AO1 K&U	AO2 Appl K&U	AO3 Data	Total	G/U	F	E	D	C	B	A	A*
Targets		12±2	28±2		36	25±2			11±2				
1a	6.3	3				1	1	1					
bi	6.3		3				1	2					
bii	6.2	2			8		2						
2a	6.2, 6.3	4				2	1	1					
b	6.2		2				1	1					
c	6.2		4		10		2	2					
3a	6.4		1				1						
b	6.4	2	2		5		2	2					
4a	6.4	1				1							
b	6.4	3				1	1	1					
c	6.4	3	2		9				3	2			
5a	6.2			3					1	2			
b	6.2	1			4				1				