AQA

Please write clearly in block capitals.

Centre number | | | | | | Candidate number | | | | |

Surname _____

Forename(s) _____

Candidate signature _____

A-level
DESIGN AND TECHNOLOGY: PRODUCT DESIGN

Paper 1 Technical Principles

Friday 7 June 2019 Morning Time allowed: 2 hours 30 minutes

Materials
For this paper you must have:
- normal writing and drawing instruments
- a scientific calculator.

Instructions
- Use black ink or black ball-point pen. Use pencil only for drawing.
- Fill in the boxes at the top of this page.
- Answer **all** questions.
- You must answer the questions in the spaces provided.
- Do not write outside the box around each page or on blank pages.
- Do all rough work in this book. Cross through any work you do not want to be marked.

Information
- The marks for questions are shown in brackets.
- The maximum mark for this paper is 120.

For Examiner's Use	
Pages	Mark
2–3	
4–5	
6–8	
9	
10–11	
12	
13–15	
16–17	
18–19	
20–21	
22	
TOTAL	

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

Do not write outside the box

0 1 Explain why 'potatopak' is a suitable material for the manufacture of disposable cutlery.
[3 marks]

0 2 Explain how BSI certification impacts on the purchase of a child's car seat by a consumer.
[6 marks]

Do not write outside the box

0 3 Give **three** benefits of using stock forms of material for a manufacturer.

[3 marks]

1 _____

_____

_____

2 _____

_____

_____

3 _____

_____

_____

0 4 PAR is a stock form of timber. What does PAR stand for?

[1 mark]

_____

_____

13

Turn over for the next question

Do not write outside the box

0 5 **Figure 1** shows a children's climbing frame.

Figure 1

Explain why powder coating is an appropriate finish for the climbing frame shown in **Figure 1**.

[6 marks]

Do not write outside the box

0 6 Define each of the following terms:

- copyright
- trademark
- patent.

[3 marks]

Copyright _____

_____

Trademark _____

_____

Patent _____

_____

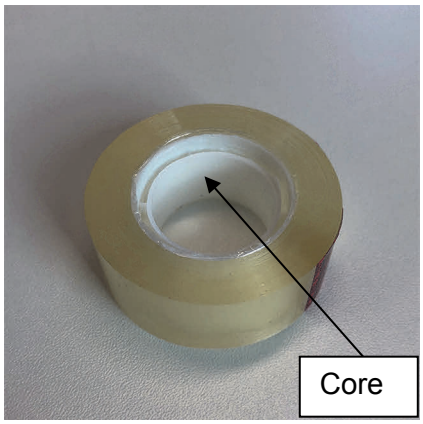
9

Turn over for the next question

Do not write outside the box

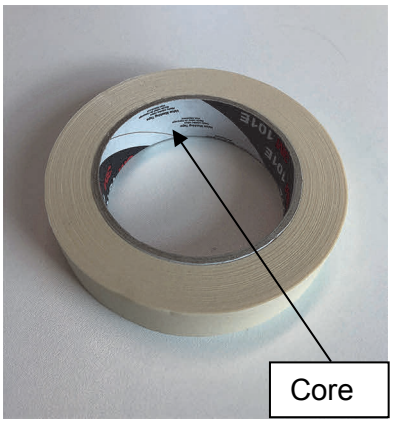
0 7 **Figures 2** and **3** show rolls of adhesive tape.

Figure 2



A roll with an ABS core

Figure 3



A roll with a cardboard core

Compare the environmental impact of the materials used to manufacture the cores of the adhesive tapes shown.

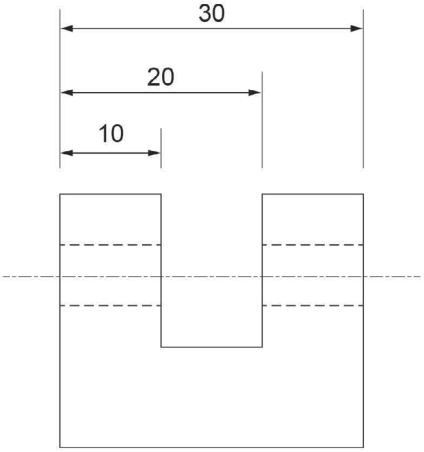
[6 marks]

Do not write outside the box

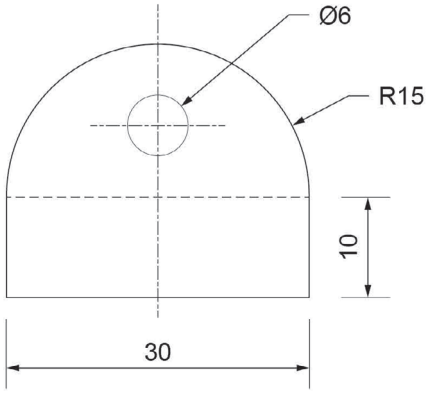
0 8 **Figure 4** shows the dimensions of a component to be made using 3D printing.

Figure 4
All dimensions in mm
Not drawn to scale

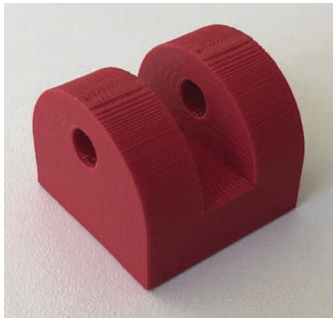
Front view



Side view



Completed component



	Material costs	
Material	**Printed density (grams per mm^3)**	**Cost per 500 g**
ABS	0.000 448 g	£18

Calculate the material cost of manufacturing 50 units.

Show your working out.

[5 marks]

Turn over ►

Do not write outside the box

0 9 Name a specific application for each of the following compliant materials:

- bleed proof paper
- duplex card
- moulded paper pulp.

[3 marks]

Bleed proof paper

Duplex card

Moulded paper pulp

14

Do not write outside the box

1 0 Evaluate the following techniques for rendering a design:

- using computer aided design (CAD)
- hand generated.

[6 marks]

6

Turn over for the next question