

A-level DESIGN AND TECHNOLOGY (PRODUCT DESIGN)

Paper 2 Designing and Making Principles

Specimen 2016

Morning

Time allowed: 1 hour 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 bottom of this page.
- Answer **all** questions.
- You must answer the questions in the spaces provided/
- Do all rough work in this book. Cross through any work that you do not want to be marked.

Information

- The marks for questions are shown in brackets.
- The maximum mark for this paper is 80.

Please write clearly, in block capitals, to allow character computer recognition.

Centre number

Candidate number

Surname

Forename(s)

Candidate signature _____

Section A

Figure 1 and **Figure 2** show two lemon juicers.



Figure 1
Aluminium Juicer



Figure 2
Polypropylene juicer

1

For each lemon juicer, compare the materials used and their suitability.

[8 marks]

2

One million units of the juicer in **Figure 2** on page 2 have been injection moulded.

Suggest how this process could be monitored to reduce the risk of defective products being sold.

[6 marks]

3

Using an appropriate product example, explain how it conforms to the design theory of 'form follows function'. In your answer, you should reference a specific design movement.

[4 marks]

4

Two vacuum cleaners are shown below.

Figure 3



Figure 4



Two vacuum cleaners are shown in **Figures 3** and **4**. Discuss the technological developments that have allowed the evolution of the product.

[9 marks]

5

Dieter Rams states that 'good design is understandable'. Use a specific product example to explain what is meant by this.

[3 marks]

6

Define the terms 'quality assurance' and 'quality control'

[2 x 2 marks]

7

The diameter of a drilled hole is specified as 25 +/- 0.5 mm.
Calculate the percentage tolerance which would be acceptable on this dimension.

Shade the box with the correct answer.

A 1%

B 2%

C 4%

D 8%

[1 mark]

10

Explain what is meant by the concept of 'upcycling'

[3 marks]

1 1

With reference to a specific product, explain what is meant by the term 'eco labelling'

[3 marks]

1	2
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With reference to food packaging, explain how designers are reducing the environmental impact of their products

[4 marks]

Turn over for next question

1 3

Compare the use of the two materials shown below for packaging large electronic products

[4 marks]**Figure 5**

Moulded paper pulp packaging

**Figure 6**

Expanded polystyrene packaging

1	4
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A video games manufacturer wants to reduce the amount of packaging for one of their products. The packaging is to keep the same proportions, but has a volume reduction of 25%.

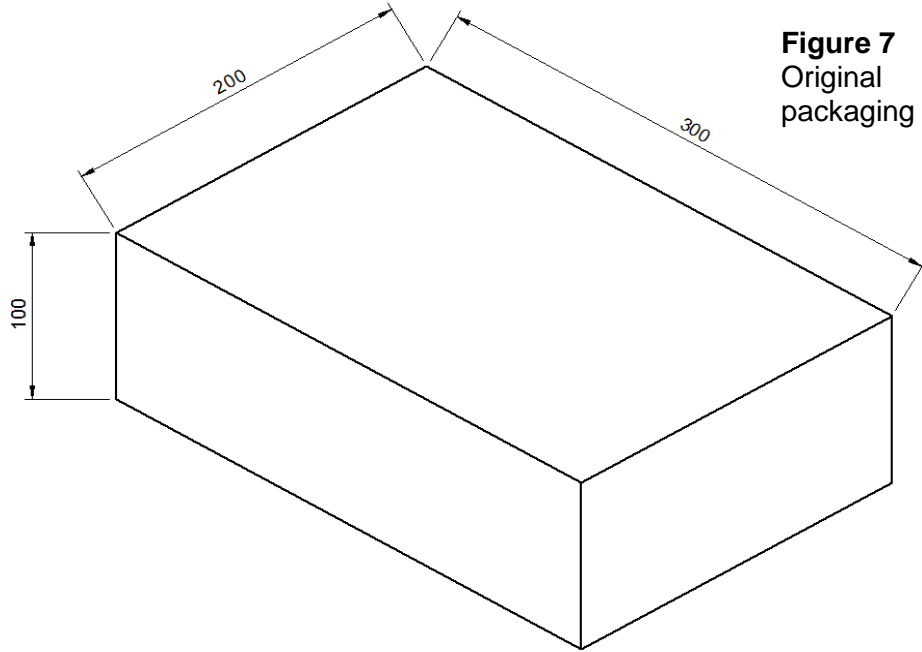


Figure 7
Original
packaging

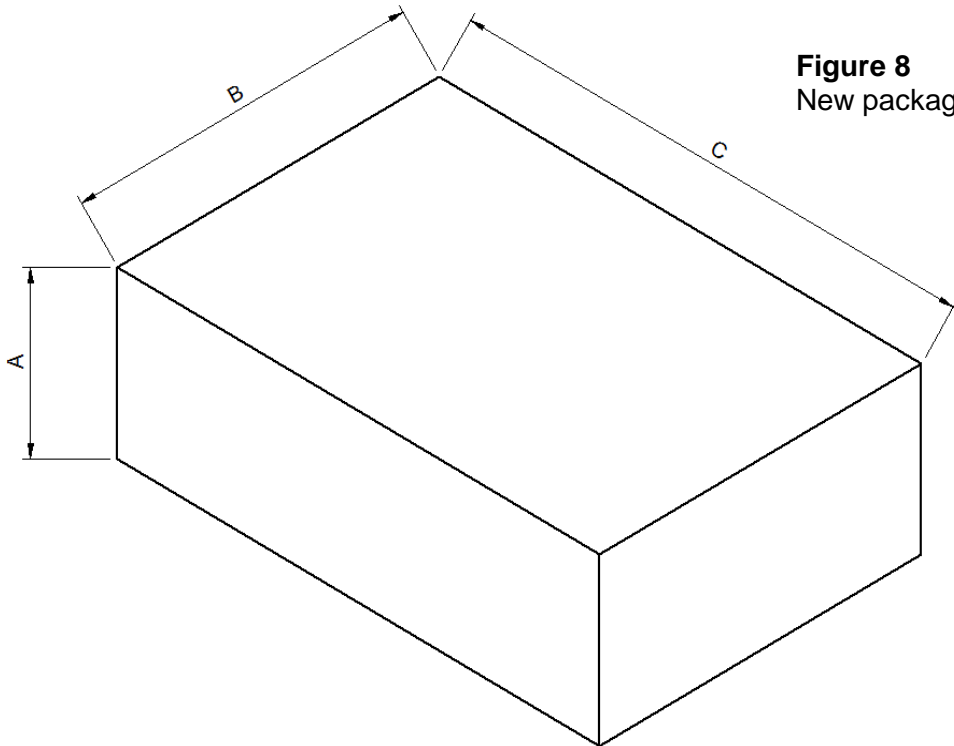


Figure 8
New packaging

Calculate the new length of each side to 2 decimal places. Show your working.

[4 marks]

A _____ mm

B _____ mm

C _____ mm

1 | 5

The photograph below shows an Eames chair.



A furniture maker is manufacturing a replica of the foot stool shown above, using a one-piece foam mould and vacuum bag.

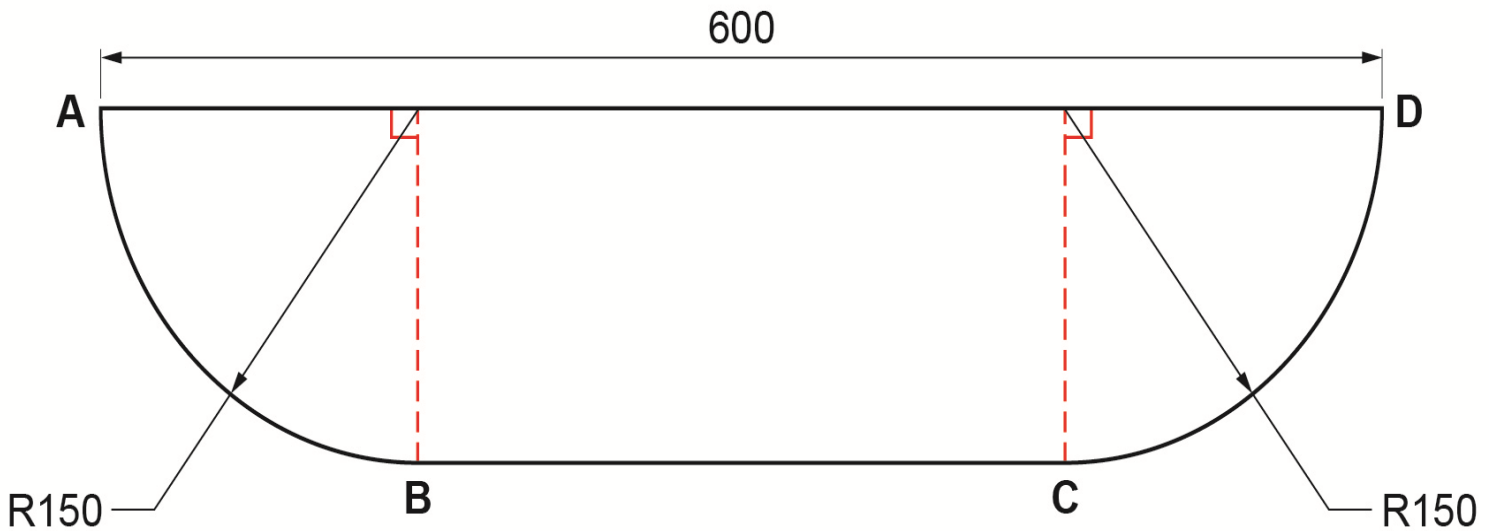


Figure 9 (foam mould)

Not drawn to scale
All dimensions in mm

It is going to be manufactured from seven layers of 1.5mm plywood. Using the dimensioned drawing (**Figure 9**), calculate the length of plywood needed for the **outside** layer of the lamination along the length ABCD to the nearest millimetre.

[4 marks]

mm
