Time allowed: 1 hour 30 minutes



# A-level DESIGN AND TECHNOLOGY (PRODUCT DESIGN)

Paper 2 Designing and Making Principles

Specimen 2016 Morning

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For this paper you must have:

- Normal writing and drawing instruments
- a scientific calculator

#### **Instructions**

**Materials** 

- 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 cle	arly, ir	blo	ck c	apita	ıls,	to a	allov	v cł	nara	acte	er c	om	put	er r	ecc	gni	itior	١.			
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### **Section A**

Figure 1 and Figure 2 show two lemon juicers.

Image of an aluminium juicer not reproduced here due to third party copyright restrictions.

Image of a polypropylene juicer not reproduced here due to third party copyright restrictions.

Figure 1 Aluminium Juicer

> Figure 2 Polypropylene juicer

2	One million units of the juicer in <b>Figure 2</b> 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]

'form follows function'. In	Tyour unowor, you	i silodid Telefelle	o a opocinio accig	

Two vacuum cleaners are shown below.

# Figure 3

Image of a vacuum cleaner not reproduced here due to third party copyright restrictions.

# Figure 4

Image of a vacuum cleaner not reproduced here due to third party copyright restrictions.

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]						

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%	$ \circ $
В	2%	$ \circ $
С	4%	$ \circ $
D	8%	

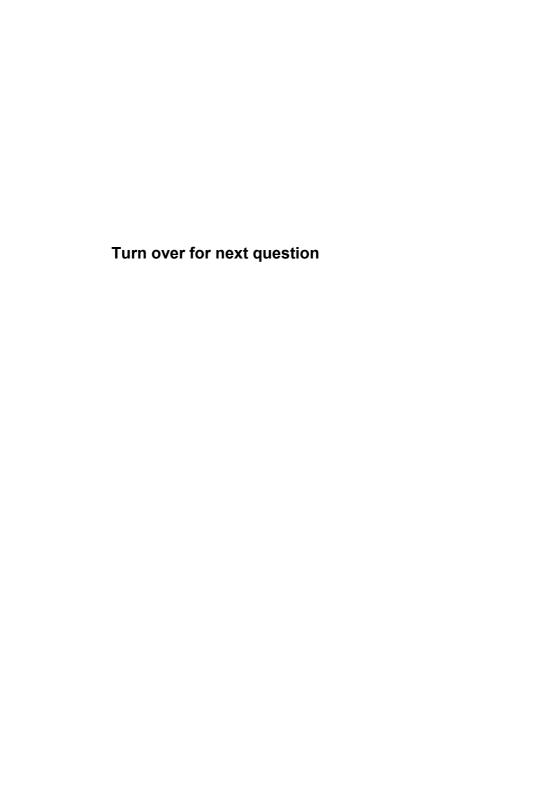
[1 mark]

on society over the last 30 y		[1

9	Using specific product examples, analyse the impact of legislation on the design of electronic products.							
		[10 marks]						

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]
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1 2	With reference to food packaging, explain how designers are reducing the environmental impact of their products	[4 marks]



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

[4 marks]

## Figure 5

Image of moulded paper pulp packaging not reproduced here due to third party copyright restrictions. Moulded paper pulp packaging

## Figure 6

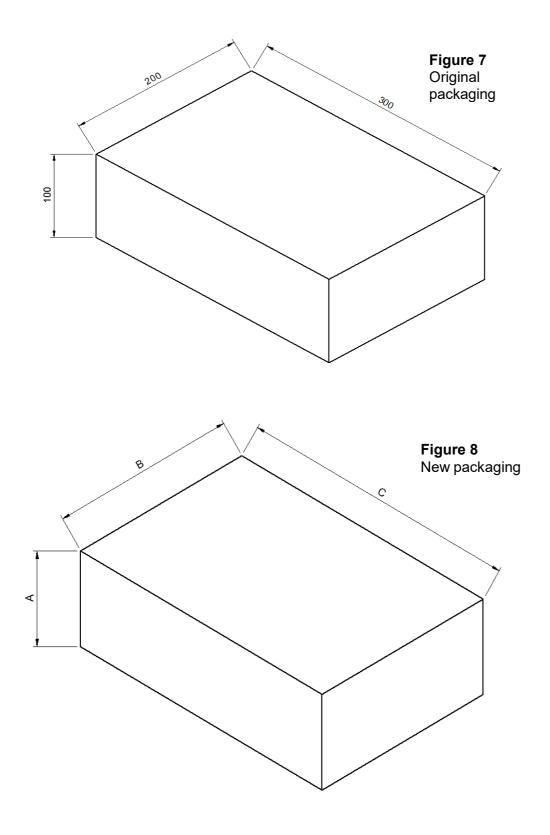
Expanded polystyrene

packaging

not nt

Image of expanded polystyrene packaging not reproduced here due to third party copyright restrictions.

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%.



Calculate the new length of each side to 2 decimal places. Show your working	Calculate the	new length of	each side to 2	2 decimal places	<ol><li>Show your working</li></ol>
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[5 marks]

A	 . mm
В	 mm
С	_ mm

The photograph below shows an Eames chair.

Image of an Eames chair not reproduced here due to third party copyright restrictions.

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

It is going to be manufactured from seven layers of 1.5mm plywood.

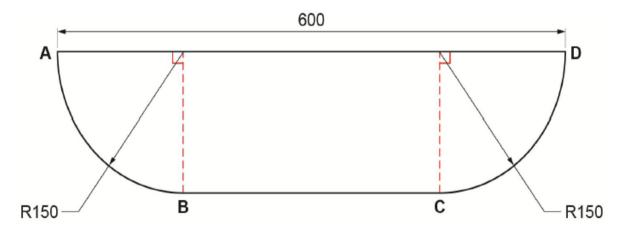


Figure 9 (foam mould)

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]

21	
	mm
	mm