

General Certificate of Secondary Education 2014

Technology and Design

Unit 3: Product Design

[GTD31]

TUESDAY 3 JUNE, AFTERNOON



TIME

1 hour, plus your additional time allowance.

INSTRUCTIONS TO CANDIDATES

Write your Centre Number and Candidate Number in the spaces provided at the top of this page.

Write your answers in the spaces provided in this question paper.

Questions which require drawing or sketching should be completed using an HB pencil. All other questions must be completed in blue or black ink.

Do not write with a gel pen.

Answer all eight questions.

INFORMATION FOR CANDIDATES

The total mark for this paper is 80.

Figures in brackets printed down the right-hand side of pages indicate the marks awarded to each question or part question.

8700.02 **ML**

			Answer all questions		Examine Marks	er Only Remark
1	(a)		w moulding and injection moulding are two common industrial nufacturing processes used to produce plastic components.			
		(i) \	Which process is a reforming process?			
				[1]		
		(ii)	Which process is a deforming process?			
				[1]		
	(b)	(i)	Outline three key features or stages of the blow moulding process.			
			1			
			2			
			3			
				[3]		
		(ii)	Outline three key features or stages of the injection moulding process.	J		
			1			
			2			
			3		Total Que	estion 1
				[3]	TOTAL QUI	2511011 1
1				l		
870	0 02 MI					

Manufacturing practices involve the use of machines and power tools.		Examiner Only
State two applications/uses of each of the following machines.		Marks Remark
Circular Saw		
1		
	[1]	
2		
	_ [1]	
Milling Machine		
1		
	_ [1]	
2		
	_ [י]	
Planer		
1		
	[1]	
0		
2	[4]	
	_ [1]	
Lathe		
1		
	[1]	
0		Total Question 2
2		75.0. 2000.0112
	_ [1]	FT
22 ML		[Turn ove

Talentry

Talent

3 Fig. 1 shows an extension ladder manufactured from aluminium alloy. Examiner Only Marks Remark © CCEA Fig. 1 (a) State why metals are alloyed. [1]

Research

Research

Parties

Research

8700.02 ML

(b)	State three properties of aluminium alloy which make it a suitable material for the ladder.		Examin Marks	er Only Remark
	1			
	2			
	3	_ [3]		
(c)	State the advantage of buying a ladder with the Kitemark or CE markings.			
(d)	Outline two design features of the ladder which are based on anthropometric data.			
	1			
	2	_ [2]		
			Total Qu	estion 3
			Total Qu	16300113
			Tur	n ove
.02 ML			լյա	

Committy

Commit

Answerding I Learning

Company

Rewarding I

The state of the s

Day Learning

Rewarding i

I Lauring

Del Lauring

Awarding 1

Del Lauring

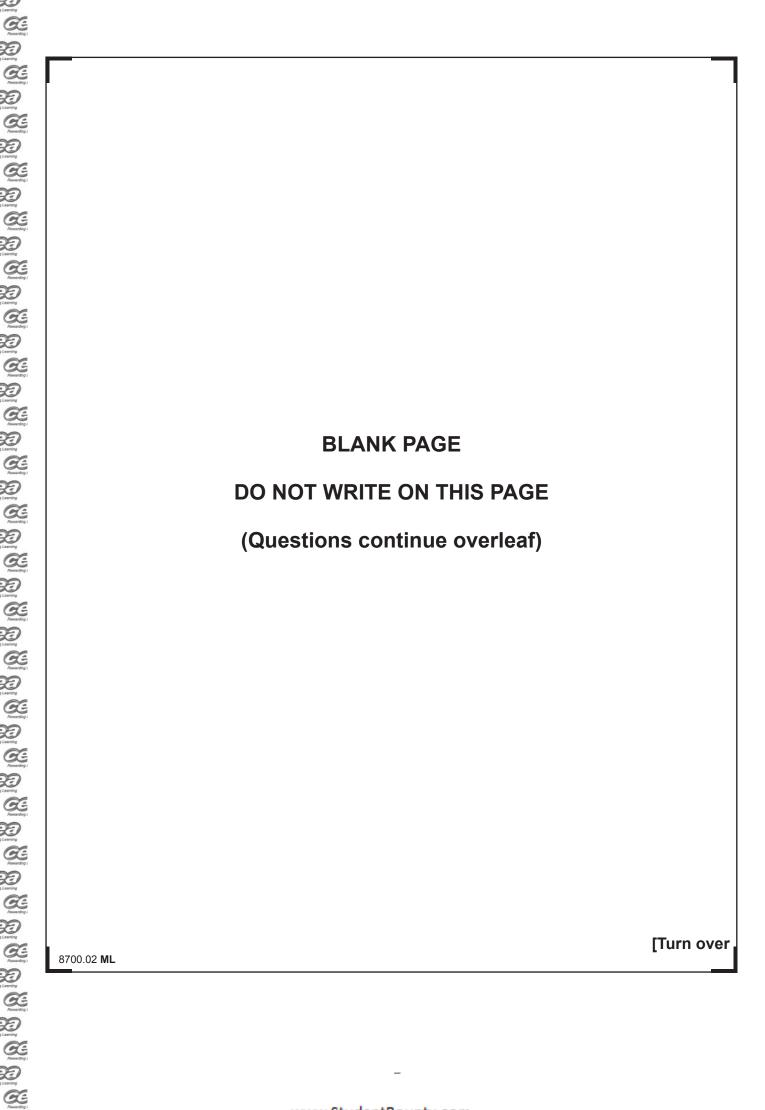
J. Lauring

J. Lauring

J. Lauring

Del Lauring

	demarks and patents.			
(a)	What is meant by Intellectual Property?			
(b)	Individuals or companies often apply for copyright, trademarks or patents. Give a brief explanation of each of the following:			
	CopyrightTrademarksPatents			
	Copyright			
	Trademarks			
	Patents			
		[2]		
			Total Qu	estion



5	(a)	is re	ompany engaged in the manufacture of gardening equipment eordering stock. The stock is reordered using the just-in-time cess.		Examiner Only Marks Remark
		(i)	Give two reasons for using the just-in-time process.		
			1		
			2		
				_ [4]	
		(ii)	The company uses standardised components.		
			Give two features of this industrial practice.		
			1		
			2	[2]	
	` '	_	. 2 shows a sketch of a wheelbarrow manufactured by the npany.		
			body – galvanised steel		
			Fig. 2		
		(i)	Give one reason why the body is galvanised.		
				₋ [1]	
0700	02 ML				

(ii)	What shape/form of material should the company order for manufacturing the body?	Examin Marks	er Only Remark
	[1]		
(iii	Name a manufacturing process which would be used to shape the		
	body.		
	[2]		
		Total Qu	estion 5
		[Tur	n over
8700.02 ML			

Tamba Carana Car

6		outline diagram of a manufactured component is shown in Fig. 3 . The gram also shows two key dimensions and their tolerance.	Examiner Only Marks Remark
	◄	90 ±0.03 Dia 50 ±0.02	
	. —		
		All dimensions in mm	
		(i) (ii)	
		Fig. 3	
	(a)	Calculate the maximum and minimum acceptable values for each of the given dimensions.	
		(i) Maximum [1]	
		(ii) Maximum [1]	
	(b)	During sample testing of the components it was found that 10% were outside the tolerance.	
		(i) Explain what is meant by sample testing.	
		[2]	
8700	.02 ML		

Remarks

- -

	(ii)	The quality control department demanded that this percentage should be reduced.	Examiner Only Marks Remark
		Give one reason why the quality control department would want this percentage reduced.	
		[1]	
	(iii)	Give one method the company could use to reduce this percentage.	
		[1]	
(c)		e two characteristics of quality assurance.	
	1	[1]	
	2	[1]	
			Total Question 6
			Total Question o
8700.02 ML			[Turn over

Committy

Commit

Answerding I Learning

Company

Rewarding I

The second of th

Rewarding i

I Lauring

Del Lauring

Awarding 1

Del Lauring

J. Lauring

J. Lauring

J. Lauring

Del Lauring

7	Free		nd sketches are frequently used in the communication of design	Examiner Only Marks Remark
	(a)	(i)	Give one reason why it is important to produce good freehand sketches.	
			[1]	
		(ii)	Annotation or notes are often added to sketches.	
			What is the purpose of adding annotation to freehand sketches?	
			[1]	
		(iii)	Give two advantages of using brief notes for annotation rather than long comments.	
			1	
			2	
			[2]	
8700 <i>(</i>	na Mi			

- -

	ne design process also makes use of modelling techniques which clude mock-ups, prototypes and computer modelling.		Examir Marks	er Only Remark
(i)	State a benefit of using computer modelling.			
		[1]		
(ii)	Explain the difference between mock-ups and prototypes. Your explanation should include how, when and why each would be used by a designer in the design process.			
		_		
		[3]		
			Total Qu	estion 7
8700.02 ML			[Tur	n over

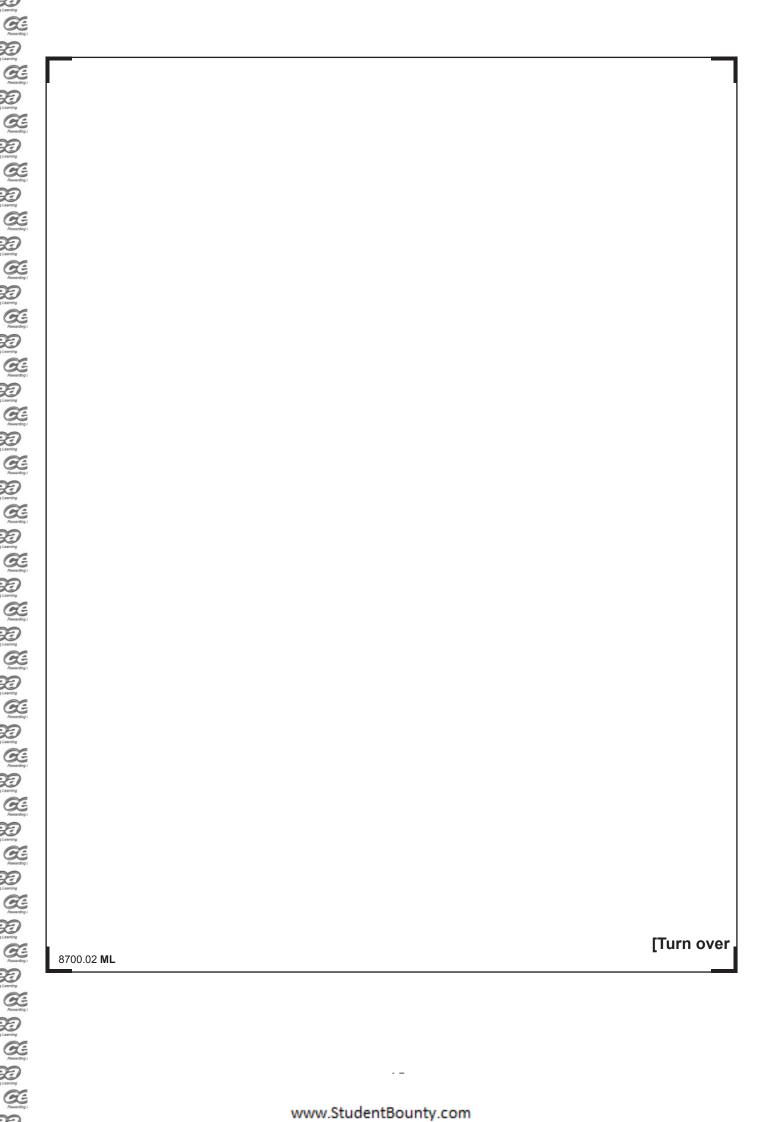
To Render I To Ren

_					
8	suit ger	ng an annotated sketch or sketches, design an adjustable desk lam table for a bedside table or unit. The lamp is to be made from materinerally available in a school workshop. The design must satisfy the bowing:		Examin Marks	er Only Remark
	•	The height or angle of the lamp should be easily adjustable.	[4]		
	•	Material(s) selection, justification and the economy of material(s) used.	[4]		
	•	It must have an on/off switch and its own 9 volt battery supply whic must be accessible to replace the battery. Details of circuit/electronic systems are not asked for.	h [4]		
	•	Must be stable to sit on a bedside table or unit.	[4]		
	•	Must be an aesthetically pleasing and functional design.	[4]		
	•	Good quality annotated sketches should be used. A minimum of the overall dimensions should be included.	ee [4]		
				Total Qu	estion 8

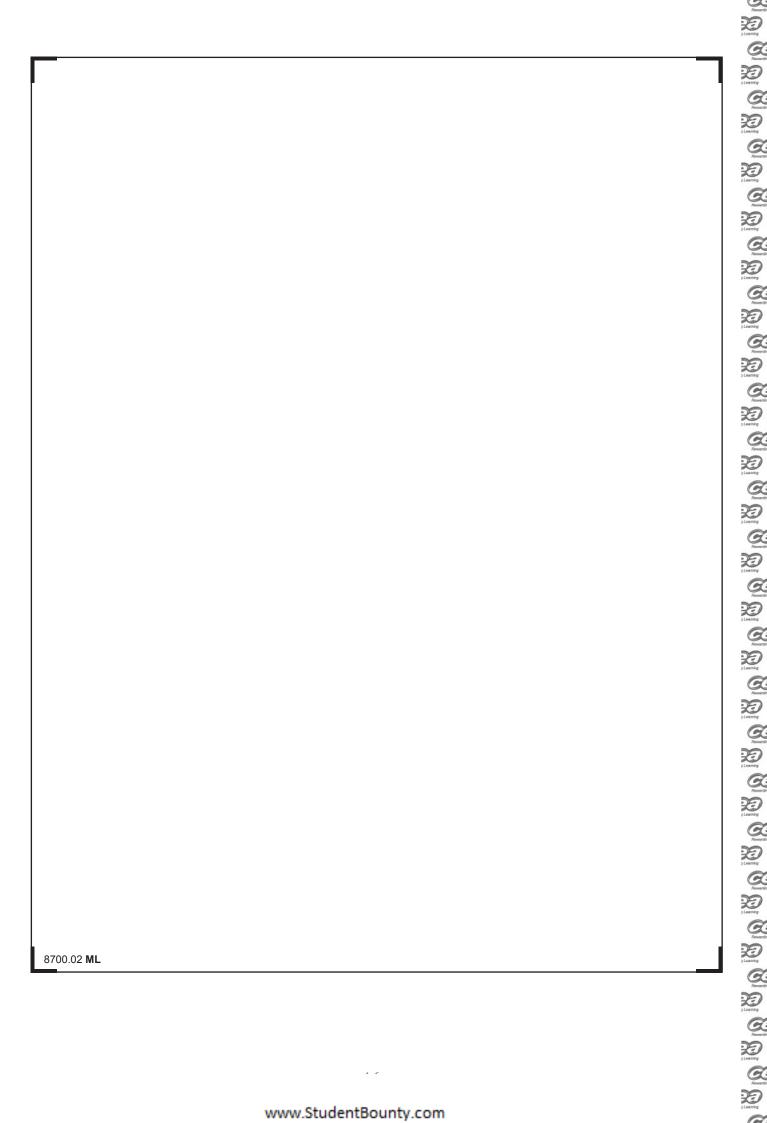
Parents

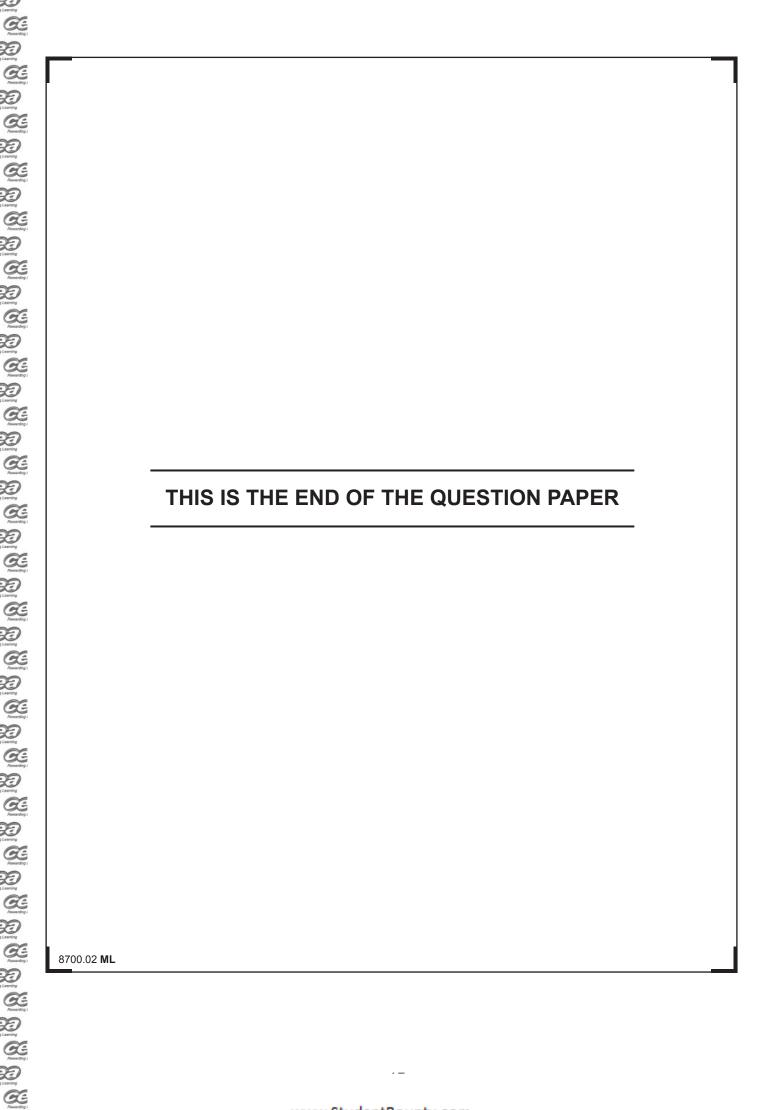
Par

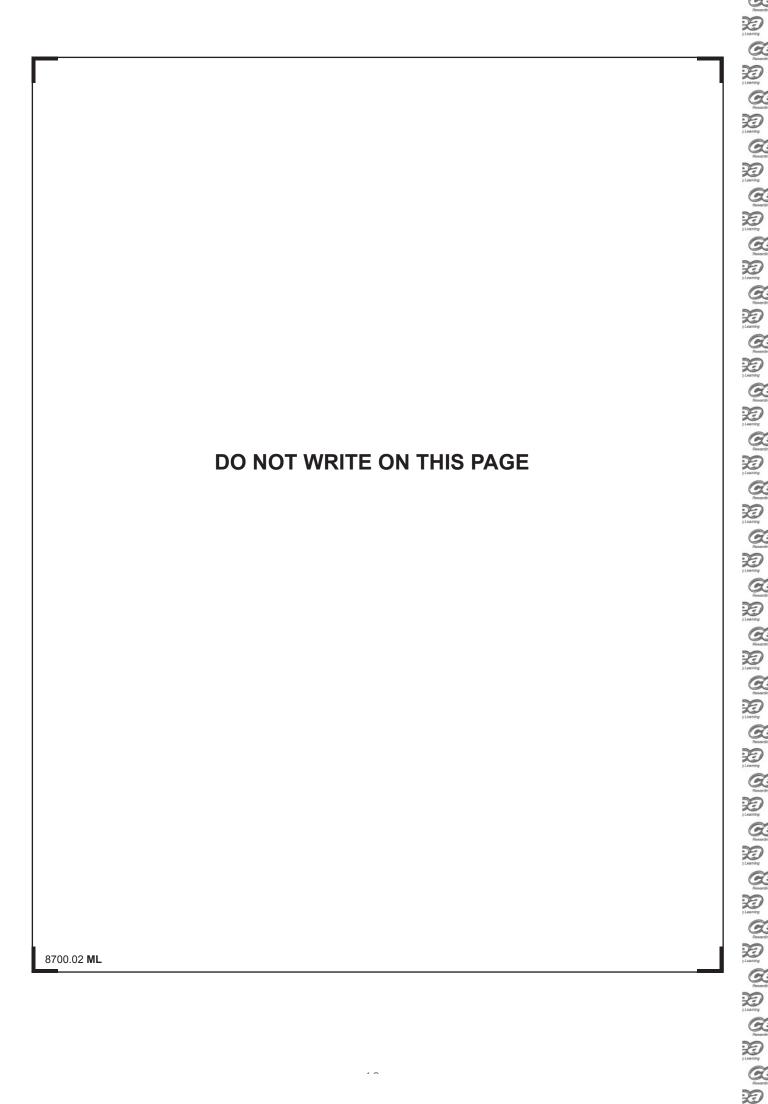
8700.02 **ML**

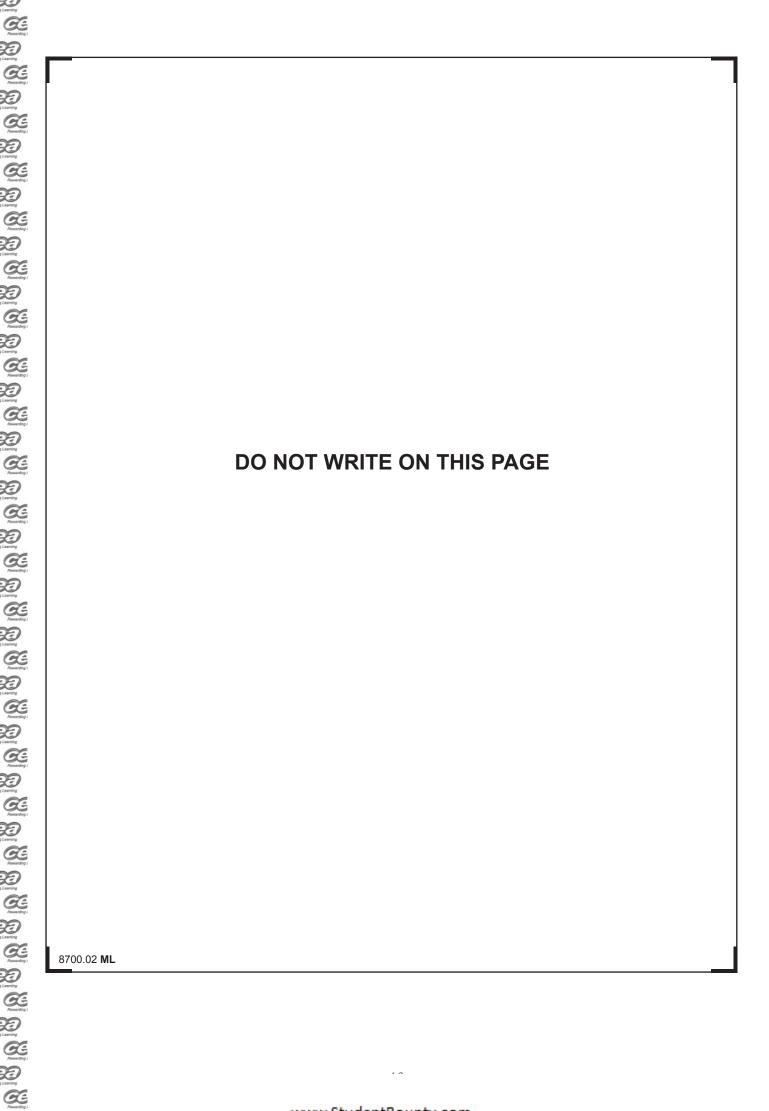


www.StudentBounty.com









DO NOT WRITE ON THIS PAGE

For Examiner's use only		
Question Number	Marks	
1		
2		
3		
4		
5		
6		
7		
8		

Total Marks

Examiner Number

Permission to reproduce all copyright material has been applied for. In some cases, efforts to contact copyright holders may have been unsuccessful and CCEA will be happy to rectify any omissions of acknowledgement in future if notified.

178185