



General Certificate of Secondary Education 2013

Technology and Design

Unit 3: Product Design

[GTD31]

FRIDAY 7 JUNE, AFTERNOON

GTD31

TIME

1 hour.

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.

Complete in blue or black ink only. **Do not write in pencil or 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.

8118

Answer all questions

1 Table 1 lists a number of materials and their properties.

(a) For each material listed, place a tick (✓) in the box that relates to the property of that material.

Property Material	Ferrous Metal	Non-ferrous Metal	Hardwood	Softwood	Thermosetting Plastic	Thermoplastic
Cedar						
Aluminium						
Epoxy Resin						
Nylon						
Copper						
Ash						
High Carbon Steel						
· !				1	[7]	Examiner Only Marks Remark
(b) Which c	of the above	materials is a	n alloy?		[1]	Total Question 1

Table 1

8118

www.StudentBounty.com

P

	company engaged in the soft drinks industry plans to develop and anufacture a new container for a new soft drink that they hope to laur	nch.	Examin Marks	er Only Remark
S	s part of the product analysis for the new container the drinks compar ib-contracts the task of developing a product specification to a produce esigner.			
(8) Outline what sub-contracting means.			
		_ [1]		
(k) Give one reason why the company may wish to sub-contract the development of the product specification.			
		_ [1]		
(0) Produce a design specification that clearly outlines six key specification points to be considered in the design of the container.			
	1	_ [1]		
	2	_ [1]		
	3	_ [1]		
	4			
	5	[4]		
	6		Total Qu	estion 2
8118			-	n over

3 The	<image/> <image/> <image/>	Examiner Marks R	Only Remark
(a)	Name two anthropometric factors that should be considered for the handrail to function satisfactorily. 1[2]		
(b)	 2 [2] The handrail was manufactured using galvanised steel. Give two appropriate reasons why galvanised steel was used for the handrail. 		
	1[1]		
	2 [1]		
118			

(0)	Part of the handrail consists of a tube and a round plate both made from the same material as shown in Fig. 1 .	Marks	ner Only Remark
	tube plate Fig. 1		
	Name a permanent method of joining the round plate to the tube of the handrail.		
(d)	Show by means of a sketch, one semi-permanent method of joining the round plate to the tube.		
		Total Q	uestion 3
	[3]		
		[Tu	n over

Mar	ny modern windows have plastic uPVC frames and double glazing.	Examiner Marks R
(a)	Give one advantage of:	
	uPVC Plastic frames compared to wooden frames	-
	Double glazing compared to single glazing	-
	[2	2]
(b)	A company engaged in the manufacture of plastic window frames places great importance on quality assurance.	
	Outline two main characteristics of quality assurance.	
	1	-
	2	_
	[2	2]
(c)	The window frames are manufactured to certain dimensional tolerances.	
	Explain what is meant by a tolerance.	
	[2	2]
(d)	In advertising the windows the company follows the Trades Description Act.	
	Explain briefly the purpose of the Trades Description Act in consumer protection.	
		Total Ques
	[2	2]



R

DO NOT WRITE ON THIS PAGE

(Questions continue overleaf)

8118

[Turn over



5	Fig. 2 shows a forklift truck used for lifting and moving materials. The truck is driven by an electric motor powered by a battery.	Examiner Only Marks Remark
	forks	
	Fig. 2	
	(a) Give one advantage and one disadvantage of this truck compared to one driven by a petrol engine.	
	Advantage	
	Disadvantage [2]	
8118		
0110	·	



(b)	The truck in Fig. 2 was designed for use in a storage warehouse. Two features of this forklift truck are its turning circle and the height to which it can raise loads.	Examir Marks	ner R
	NOTE: The turning circle is the amount of space that a vehicle needs in order to go round in a complete circle.		
	Explain why each of these features is important for use in a storage warehouse.		
	Turning circle		
	Lifting height		
	[4]		
(c)	Ergonomics was considered in the design of the truck.		
	Outline two ergonomic features which should be considered in the design of the truck.		
	1		
	2		
	[2]		
		Total Q	ues
		[Tur	'n

6	A pr	oduct life cycle consists of five important stages.		Examiner Only Marks Remark
	One	of these stages is called the Growth stage.		
	(a)	Name the other four stages.		
		1	[1]	
		2	_ [1]	
		3	_ [1]	
		4	_ [1]	
	(b)	Outline four characteristics associated with the growth stage of a product.		
		1	_ [1]	
		2		
		3		
		4		
			_ [1]	
				Total Question 6
8118				

7	(a)	Name two smart materials and suggest a use for each.	Examiner Only	ĺ
		Smart material 1 [1]	Marks Remark	
		Use [1]		
		Smart material 2 [1]		
		Use [1]		
	(b)	For each smart material above outline a main property.		
		Property (Smart material 1)		
		[1]		
		Property (Smart material 2)		
		[1]		
	(c)	In what way has the development of smart materials offered product designers new opportunities?		
		[2]		
		[2]		
			Total Question 7	-
8118			[Turn ove	r

8118			Total Qu	Jestion 8	
	Use the following blank pages for your answer.				
	The menu is displayed on a sheet of paper 150 mm \times 115 mm wide				
	Use the following information to help you:				
	• Your answer should include necessary key dimensions	[2]			
	 Good quality sketches with notes 	[4]			
	Must be freestanding and stable to sit on a tableMust be an aesthetically pleasing design	[4] [2]			
	Allow easy access to change the menu	[4]			
	 Material(s) selection, justification and the economy of material(s) used 	[4]			
	• Hold the double sided menu securely and allow the contents of the menu to be read easily from both sides	[4]			
8	Using an annotated sketch or sketches design a holder to display a me for a cafe. The design must satisfy the following specification points:	nu	Examin Marks	er Only Remark	

D



Resertin

8118

THIS IS THE END OF THE QUESTION PAPER

8118

3



DO NOT WRITE ON THIS PAGE

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

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.

113215

www.StudentBounty.com

R