

Design and Technology

General Certificate of Secondary Education

Unit **A542**: Industrial Technology Sustainable Design

Mark Scheme for January 2011

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All Examiners are instructed that alternative correct answers and unexpected approaches in candidates' scripts must be given marks that fairly reflect the relevant knowledge and skills demonstrated.

Mark schemes should be read in conjunction with the published question papers and the Report on the Examination.

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Question			Expected answer	Mark	Additional guidance
Section A					
1			b) Global company	[1]	
2			b) Restrictions on the use of Hazardous Substances	[1]	
3			c) Miniaturised products	[1]	
4			d) Carbon footprint	[1]	
5			a) Solar energy	[1]	
6			Product life cycle	[1]	Accept - life cycle
7			Recycling	[1]	Accept secondary or tertiary recycling. Not primary recycling
8			Non-renewable	[1]	
9			Polystyrene	[1]	Only acceptable answer
10			Bio-degradable	[1]	
11			Thermosetting plastics can be recycled FALSE	[1]	
12			A product that can be reused has built in obsolescence FALSE	[1]	
13			Waste from production should be reduced TRUE	[1]	
14			Planting trees will offset carbon footprint.. TRUE	[1]	
15			Modular design is better for servicing and repair. TRUE	[1]	
			Section Total	[15]	

Question			Expected answer	Mark	Additional guidance
Section B					
16	(a)		Recycle - reprocess steel Reuse - use to make a different product or for alternative use Repair - fix broken hardwood frame Rethink – give an alternative design or method of supporting the hammock 1 each	[4]	Accept a description of the term
	(b)	(i)	Using less /not over packing printing instructions and safety on box not use polystyrene block – tape items to stop movement putting small items in one bag not wrapping the hammock or hardwood frame.	[3]	
		(ii)	A method that shows clear rethinking of packaging. Eg: card packaging for all parts and box, no plastic materials involved. Eg: Wrap all parts in the hammock fabric and put in card tube. Made from recycled materials - 1	[2]	0 mark for reducing existing packaging 1 mark if idea is similar to original packaging Full marks for innovative and justified idea.
	(c)	(i)	High energy used in making CO ₂ (green house gas) emissions, increase in global warming Manufacturing waste could be disposed of inappropriately	[3]	Must refer to manufacture
		(ii)	Landfill sites becoming full litter inappropriate burning damage/pollution to environment danger to animals	[3]	
			Total	[15]	

Question			Expected answer	Mark	Additional guidance
17	(a)	(i)	hardwood chair B,	[1]	
		(ii)	Injection moulding Metal forming (bending) Fabrication (welding) Surface protection of metal 1 each	[2]	Must relate to manufacturing stages. Moulding not accepted
		(iii)	Anthropometric data Anthropometrics	[1]	
		(iv)	British Standards	[1]	
	(b)		Made from timber/materials which can be replenished to maintain supply 2 Made from reused timber/materials 1	[2]	
	(c)		Plastic/materials used has come from recycled and reprocessed products	[2]	
	(d)		Explanation may include: Safe and hygienic working conditions Living wage Sensible working hours Employment is freely chosen Child labour is prevented No discrimination or inhumane treatment Equality for men and women Regular employment Level 1 (0-2 marks) Basic explanation, showing some understanding of Ethical Trading Initiative (ETI). Can provide a description of some of the areas of possible influence. There will be little or no use of specialist terms. Answers may be ambiguous or disorganised or 'list like'. Errors of grammar, punctuation and spelling may be intrusive.		

Question			Expected answer	Mark	Additional guidance
			<p>Level 2 (3-4 marks) Adequate explanation, showing an understanding of Ethical Trading Initiative (ETI). There will be some use of specialist terms, although these may not always be used appropriately. The information will be presented for the most part in a structured format. There may be occasional errors in spelling, grammar and punctuation</p> <p>Level 3 (5-6 marks) Thorough explanation, showing clear understanding of Ethical Trading Initiative (ETI). There will be clearly identified and explained points. Specialist terms will be used appropriately and correctly. The information will be presented in a structured format. The candidate will demonstrate the accurate use of spelling, punctuation and grammar.</p>	[6]	
			Total	[15]	

Question		Expected answer	Mark	Additional guidance	
18	(a)	kinetic, mechanical	[1]		
	(b)	rechargeable batteries have no toxic materials/ not disposing of batteries in the environment can be recharged many times cost efficient – no batteries to repurchase/ throw away	[2]		
	(c)	Specification points- use less materials / resources use recycled material be recyclable reduce waste material by design or manufacture be a repairable material be durable/longlasting 1 each specification point	[3]	Must relate specifically to the materials used	
	(d)	little waste quick method for manufacturing high volume cost effective can use reprocessed/ recycled material/waste	[3]		
	(e)	(i)	energy to make it uses fuels and gives off CO ₂ adding to or increasing carbon footprint.	[2]	increase in carbon footprint – only 1 mark
		(ii)	energy to operate it is free and therefore carbon neutral	[2]	neutral or decrease in carbon footprint – only 1 mark
	(f)	Disassembly reuse of parts recycling of materials reprocessing to make new item repairing and extending life	[2]		
			Total	[15]	
			PAPER TOTAL	[60]	

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