

Design and Technology

General Certificate of Secondary Education

Unit **A542**: Industrial Technology Sustainable Design

Mark Scheme for June 2013

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This mark scheme is published as an aid to teachers and students, to indicate the requirements of the examination. It shows the basis on which marks were awarded by examiners. It does not indicate the details of the discussions which took place at an examiners' meeting before marking commenced.















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.

OCR will not enter into any discussion or correspondence in connection with this mark scheme.

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Annotations

Annotation	Meaning
	Unclear
	Benefit of doubt
	Cross
	Irrelevant (used for languages)
	Level 1
	Level 2
	Level 3
	Two statements are linked
	Benefit of doubt not given
	Poor diagram
	Repeat
	Noted but no credit given
	Too vague
	Tick

Subject-specific Marking Instructions**IMPORTANT UPDATE:**

ADDITIONAL OBJECTS: You **must** assess and annotate the additional objects for each script you mark. Where credit is awarded, appropriate annotation must be used. If no credit is to be awarded for the additional object, please use annotation as agreed at the SSU, likely to be 'seen' or the highlighting tool.

CROSSED-OUT ANSWERS

- i. where a candidate crosses out an answer and provides an alternative response the crossed out response is not marked and gains no marks
- ii. where a candidate crosses out an answer to a whole question, but makes no second attempt and the inclusion of the answer would not cause a rubric infringement, the assessor should attempt to mark the crossed out response and award marks appropriately.

DUPLICATED ANSWERS

- normally all responses are marked and the highest mark given
- where alternate answers are provided to a multiple choice question, no mark should be awarded (for example: following a request to tick one box, the candidate ticks two or more boxes)
- where the candidate provides contradictory responses, no mark should be awarded (for example: the candidate writes a statement such as 'water freezes at 0°C this means it is a liquid at -10°C'). The candidate, here, does not seem to understand the context of the 'question'
- where the candidate has adopted a 'scattergun' approach by providing multiple answers to a single response question, no mark should be awarded.

SECTION A

Question		Answer	Marks	Guidance
1		c	1	Only acceptable answer.
2		c	1	Only acceptable answer.
3		b	1	Only acceptable answer.
4		a	1	Only acceptable answer.
5		d	1	Only acceptable answer.
6		Refuse	1	Only acceptable answer.
7		Primary, secondary or tertiary	1	Accept any one.
8		Global, global/multinational company	1	Only acceptable answer.
9		Evaluation	1	Only acceptable answer.
10		Life cycle	1	Only acceptable answer.
11		Carbon offsetting generates low cost electricity.	1	False
12		Sustainable wood is not biodegradable.	1	False
13		Toxic materials can harm the environment.	1	True
14		Ferrous metals cannot be recycled.	1	False
15		The eco footprint of a product measures impact on the environment.	1	True
		Total	15	
		Section A Total	15	

SECTION B

Question			Answer	Marks	Guidance
16	(a)	(i)	Polypropylene, Polyethylene, ABS – any other suitable plastic.	1	Accept any suitable plastic.
	(b)		Environmental advantages include – material is recyclable and so less landfill impact. Fewer raw materials used. Product will have a long life as it will not degrade quickly and so reduce the need for manufacturing and associated environmental impact.	4	1 mark for each justified point.
	(c)		Cast iron frame will rust and slowly degrade, eventually fall apart. The wooden slats will absorb water and slowly rot away eventually breaking.	4	2 marks for each fully justified answer.
	(d)		Cast aluminium alloy Aluminium is lightweight so easy to move chair. It will not rust and so will retain its integrity for longer than steel or cast iron.	3	1 mark for a suitable metal. Accept aluminium. 1 mark for each justified point.
	(e)		Energy resources used to cut down and transport the timber overseas increase the carbon footprint. Distribution after conversion to timber yards also adds to the carbon footprint.	3	Marks awarded for a fully justified response.
Total				15	

Question			Answer	Marks	Guidance
17	(a)	(i)	May wish to express their interest in other cultures. May wish to support development in less developed countries, by buying their products. Belong to that cultural group but live in a different country. Like the cultural designs, symbolism. May be cheaper than handmade in UK/Europe. Prefer handmade item. Like unique/ one off product.	2	1 mark for a point identified and justified. 2 marks max.
		(ii)	May fear that workers (possibly children) are being exploited and don't wish to promote it. Are not interested in, or perhaps are fearful of a different culture. Don't understand the culture, or may be offended by the products symbolism, colour etc. Concern over transport miles and high carbon footprint. Item may not FSC. Prefer to support local manufacturers.	2	1 mark for a point identified and justified. 2 marks max.
	(b)		Modifications could look at eliminating the finger traps, rounding sharp corners, removing the overhang to prevent toddlers bumping their heads, removing larger hole that heads could get trapped in.	4	2 marks for sketching. 2 marks for labels.
	(c)		Colour, pattern, shape, looks, feel, smell, finish, proportion, material.	3	1 mark for each point.
	(d)		Fairtrade is about better prices, decent working conditions, local sustainability, and fair terms of trade for farmers and workers in the developing world. The Fairtrade sticker informs the consumer that the product is made with sustainable development in mind, so that workers can maintain a decent and dignified livelihood and develop their full potential.	4	1 mark each for noting the main points (4 marks maximum).
Total				15	

Question		Answer	Marks	Guidance
18	(a)	Internal digital storage, memory card for expanding memory, rear viewing of photos, can delete unwanted photos. No need for film, and not restricted by capacity of film – can take hundreds of photos on one memory card. No need to print photos can view on screen. Touch button technology. More features for editing photos on the camera. Rechargeable battery as standard. Better picture quality /resolution.	3	1 mark for each point made.
18	(b) (i)	It is important to reduce packaging in order to reduce landfill, product cost, carbon footprint, waste, material use. Important to reduce consumption of finite raw materials because of the impact of extraction, transport and production costs.	3	1 mark for a point identified and justified. 3 marks max.
	(ii)	Use recycled/recyclable material like pulp fibre profile to keep camera safe. Pack accessories in recyclable paper or card bags or don't wrap them at all. Place in card or cardboard box. Seal box with sticky tape rather than being wrapped in excessive shrink wrap.	3	1 mark for a point identified and justified. 3 marks max. Reducing size of packaging not accepted.

Question		Answer	Marks	Guidance	
				Content	Levels of response
18	(c)*	<p>Discussion to revolve around advances in technology which have reduced environmental impact of products.</p> <p>For example – designing more fuel efficient cars which reduces demand for fossil fuels, creating less damaging emissions. The drive for low emission engines. Development of hybrid and electric cars to reduce dependence on fossil fuels and a drive for less carbon emissions. Proliferation of rechargeable batteries – less waste etc. Low energy use electrical products such as washing machines, laptops, TVs etc. Kettles capable of boiling only one cup of water. More efficient hot water boilers for heating. Double/triple glazed windows. Low energy light bulbs. Use of LEDs rather than bulbs so extending life. LEDs used in car lights which last life of the car. Solar powered calculators, clocks, watches, street lighting etc. Development of sustainable products such as those made of entirely recyclable materials.</p> <p>Discussion must relate to reduced and specific environmental impact of a given product.</p>	6	<p>Basic discussion, showing some understanding of the issues and advances. 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. List of one or two points maximum one mark. List of three or more maximum two marks.</p> <p>Adequate discussion, showing reasonable understanding of the issues and advances. 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>Thorough explanation, showing a good understanding of the issues and advances. There will be three or more 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>	<p>Level 1 (0–2 marks)</p> <p>Level 2 (3–4 marks)</p> <p>Level 3 (5–6 marks)</p>
		Total	15		
		Section B Total	45		
		Paper Total	60		

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