RECOGNISING ACHIEVEMENT

GCSE

Design and Technology

General Certificate of Secondary Education

Unit **A542:** Industrial Technology Sustainable Design

Mark Scheme for June 2012

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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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Section A

Question			Answer	Marks	Guidance
1			a	1	Only acceptable response.
2			d	1	Only acceptable response.
3			b	1	Only acceptable response.
4			d	1	Only acceptable response.
5			b	1	Only acceptable response.
6			Globalisation	1	Only acceptable answer.
7			Global Unity logo	1	Only acceptable answer.
8			Aluminium drinks can etc	1	Any product made from recycled aluminium.
9			Risk assessment.	1	Only acceptable response.
10			CFC	1	Only acceptable response.
11			True	1	Only acceptable answer.
12			False	1	Only acceptable answer.
13			False	1	Only acceptable answer.
14			True	1	Only acceptable answer.
15			False	1	Only acceptable answer.
			Section A Total	**15**	

Section B

Question			Answer	Marks	Guidance
16	(a)	(i) (ii) (iii)	Product can be recycled, recycling logo. 1 means product is made of PETE. Any non- recyclable plastic – urea formaldehyde, Bakelite, duroplast, polyimides, epoxy resin etc	1 1 1	 Accept type of plastic, polythene, polyethylene Accept thermoset plastic
16	(b)	(i) (ii) (iii)	Primary recycling – second-hand use of items. Giving to friend. Sending overseas. Secondary recycling – waste materials are recycled into different types of products. . Creating a new product from an old one. Tertiary recycling – products are broken down and reformulated eg plastic bottles recycled into polyester.	6 (3 x 2)	Full explanation 2 marks. Just second hand use for example – 1 mark.
16	(c*)		Discussion to revolve around the following themes. Designing products in order to counteract or reduce the problems caused by: The depletion of the world's finite natural resources such as oil, coal natural gas. Problems linked to CO2 emissions. Depletion of ozone layer etc The issue of global warming caused by manufacturing activities, oil based transport methods, Examples could include: - designing products from recyclable and using recycled plastics. - using more sustainable processes like blow moulding or injection moulding. - reducing waste in manufacturing plastic products - designing products which will use as little plastic as possible but still retain their physical integrity.	6	**6X1 marks** Basic **discussion**. 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. Adequate **discussion**, showing some understanding. 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 Thorough **explanation.** There will be three of more clearly identified and explained points. Specialist terms will be used appropriately and correctly. The information will be presented in a structured format.

Question			Answer	Marks	Guidance
			- making biodegradable plastic products. - considering end of life disposal of plastic products.		The candidate will demonstrate the accurate use of spelling, punctuation and grammar. 0 = a response not worthy of a mark. Add 'Seen' at end of response
			Total	**15**	

Question			Answer	Marks	Guidance
17	(a)		Management of forests in a way that maintains their biodiversity, productivity, regeneration capacity, vitality and their potential to fulfill relevant ecological, economic and social functions which does not cause damage to other ecosystems.	2	1 mark for each point made. Maximum of 2 marks. Replanting or reforestation only, maximum 1 mark.
17	(b)	(i)	Stewardship	1	Only acceptable answer.
		(ii)		2	2 marks for a including the tree and FSC in correct orientation. 1 mark only for having tree or FSC in wrong place. 0 mark for only tree or only FSC.
17	(c)		Metal – deforestation caused by mining. Scaring of landscape. Production of green house gases released during extraction, refining, producing, and transporting metal to manufacturer. Plastic – pollution and visual impact caused by drilling for oil. Green house gases produced during transportation, refining and manufacture of plastics.	4	1 mark for each point made. Maximum of 4 marks.

Question			Answer	Marks	Guidance
17	(d)		Designing products that take into account their impact on the environment and sustainability at all stages of their life cycle from design to finished item. For example it may result in the choice of a biodegradable material for packaging or development of a washing powder effective in cold water to reduce energy consumption.	3	1 mark – analysing the products environmental impact from design to finished article. 1 mark – analysis of the products use of materials. 1 mark – analysis of the products use of energy.
17	(e)		Less heat loss than single glazed. Modern low-emissivity glass (Low-E) will allow the sun's heat and light to pass through the glass into the building, but it will prevent the heat from leaving the room. Reduces energy consumption by reducing heat loss which can be 25% through a window. Improved sound insulation, reduction of external / internal noise.	3	1 marks for each justified point made.
			Total	**15**	

Question			Answer	Marks	Guidance
18	(a)		The plastic toy.	1	Only answer.
18	(b)		Description of wind, tidal, hydro. For example: Wind – using a wind turbine placed in a windy spot to turn the electrical generator. Hydro may refer to placing dam on river and using the water to turn turbines. Tidal – setting up a barrage or wave generator to power the generator. Solar – using banks of solar panels and storing the electricity in batteries.	4 (2x2)	1 mark for each suitable type (max 2). 2 mark for describing the system in detail
18	(c)		Save money on packaging material. Less cost to transport. Creates green image of company. Less waste of fossil fuels during manufacture & reduced CO2 emissions. Less mass going to landfill. Less litter.	4 (2x2)	2 marks for each justified reason given.
18	(d)	(i)	A consumer would know the toys are safe to purchase by looking for a quality mark such as the BSI Kite mark on the product or the CE symbol (European Standards).	2	1 mark for indicating product has a safety logo /symbol on package or product. 2 marks for specific safety standard (BSI / CE)
		(ii)	The material is not toxic. The parts are too large to swallow. There are no sharp edges. Parts are lightweight.	4 (2 x 2)	2 marks for each justified explanation.
			Total	**15**	
			Section B Total	**45**	
			Question Paper Total	**60**	

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