RECOGNISING ACHIEVEMENT

GCSE

Design and Technology

General Certificate of Secondary Education

Unit **A544:** Industrial Technology Technical Aspects of Designing and Making

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.

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 UPATE:

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.

Question			Answer	Marks	Guidance
1	(a)	(i)	**B** Self-tapping screw **C** Grub screw **D** Spring washer **E** Bolt **F** Rivet (5x1)	5	Accept 'screw' Accept 'locking/split washer'
		(ii)	**Tool 2** Spanner used with E (1x1) **Tool 3** Allen Key used with C (1x1) (2x2)	4	
	(b)		Cheaper to buy than make Standard components make assembly easier No need for machines/workers to make parts Consistent quality of bought in components Can be bought when needed/no need to stock large numbers May make product cheaper for customers One mark for each valid point (3x1)	3	
			Total	**12**	

Question			Answer	Marks	Guidance
2	(a)		Cast iron; high speed steel; mild steel; stainless steel (2x1)	2	
	(b)		Vice jaw – Cast iron – strong and easy to make shape Sink – Stainless steel – doesn't rust/doesn't scratch easily Lathe guard – Polycarbonate – tough and shatter resistant (6x1)	6	Accept durable/good finish
	(c)		Vice jaw – (boxless) sand casting; shell moulding Sink – pressing/stamping Lathe guard – laser cutting/cnc machining; thermoforming; injection moulding	1	
	(d)		Explanation to include reference to the two main features: Responding to changes in external stimuli (heat; light; pressure) (1) Changes in material (1) One mark for the use of a suitable example (1) (3x1)	3	Example required for full marks
			Total	**12**	

Question			Answer	Marks	Guidance
3	(a)	(i)	**1** Heaters **2** Hopper **3** Mould **4** Feed screw (ram) (4x1)	4	Accept appropriate description of part
		(ii)	Vacuum forming; blow moulding; extrusion; press forming; line bending (2x1)	2	

Question			Answer	Marks	Guidance	
					Content	**Levels of response**
	(b)*		Up to six marks for an explanation or critical evaluation of the benefits of making products using plastics moulding processes.	6	Explanation may include consideration of the following points: Once mould is made, large numbers of products can be produced. Less manual labour required. Consistent quality of products. Quick change over of moulds (less 'down' time). Colour change quick and easy. Complex shapes can be made. Little or no machining of product needed. Less material waste/can be re-used. Reduced energy costs Environmental benefits	**Level 3 (5–6 marks)** Shows clear understanding of the benefits of making products using plastics moulding processes. Specialist terms will be used appropriately and correctly. The information will be presented in a structured format. The candidate can demonstrate the accurate use of spelling, punctuation and grammar. **Level 2 (3–4 marks)** Shows some understanding of the benefits of making products using plastics moulding processes. 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. **Level 1 (1–2 marks)** Shows only limited understanding of any of the benefits of making products using plastics moulding processes. There will be little or no use of specialist terms. Answers may be ambiguous or disorganised. Errors of grammar, punctuation and spelling may be intrusive 0 = a response not worthy of a mark. Add 'Seen' at end of response.
			Total	**12**		

Question			Answer	Marks	Guidance
4	(a)		2 Mark hole centres Centre punch (and hammer) 4 Tap/thread holes M4 taper tap (and wrench) 5 File/countersink/larger drill (5x1)	5	
	(b)	(i)	Riveting; superglue; epoxy resin/two-pack adhesive; double sided tape	1	
		(ii)	Laser cutting; pressing/stamping; (CNC) milling; water-jet cutting (2x1)	2	
	(c)		One mark for each spec. point covered in a workable design of jig. (4x1)	4	
			Total	**12**	

Question			Answer	Marks	Guidance
5	(a)	(i)	Easier to see contents of unit Easier to remove items from unit Safer to use Cheaper to buy Holds any size leaflet/brochure (2x1)	2	
		(ii)	Uses less material/made from one piece of plastic Is quicker to make Fewer processes involved Does not need assembling Lower production/material costs (2x1)	2	
	(b)		Thermoplastics are easily recycled Less waste material Less energy used in production One mark for each of up to two points made Two marks for one point fully justified (2x1)	2	Justified response for full marks 1mark only for 'thermoplastics can be recycled but thermosets can't.'

Question			Answer	Marks	Guidance	
					Content	**Levels of response**
	(c)*		Up to six marks for an explanation or critical evaluation of the advantages and disadvantages of using the 'just in time' (JIT) manufacturing system.	6	Explanation may include consideration of the following points: Less storage space needed. More manufacturing space available. Products delivered as soon as completed. Quality assured components delivered. Parts delivered to right place on assembly line. Only required number of parts ordered at a time (no waste). Hold-ups on delivery can cause total loss of production. Transport problems are disruptive.	**Level 3 (5–6 marks)** Shows clear understanding of the advantages and disadvantages of using the 'just in time' (JIT) manufacturing system. Specialist terms will be used appropriately and correctly. The information will be presented in a structured format. The candidate can demonstrate the accurate use of spelling, punctuation and grammar. **Level 2 (3–4 marks)** Shows some understanding of the advantages and disadvantages of using the 'just in time' (JIT) manufacturing system. 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. **Level 1 (1–2 marks)** Shows only limited understanding of any of the advantages and disadvantages of using the 'just in time' (JIT) manufacturing system. There will be little or no use of specialist terms. Answers may be ambiguous or disorganised. Errors of grammar, punctuation and spelling may be intrusive 0 = a response not worthy of a mark. Add 'Seen' at end of response.
			Total	**12**		
			Paper Total	**60**		

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