

# **Design and Technology**

General Certificate of Secondary Education **1056/02 & 1956/02**

Resistant Materials Technology

## **Mark Scheme for June 2010**

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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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**General advice to Assistant Examiners on the procedure to be used**

YOU WILL BE REQUIRED TO MARK PRACTICE AND STANDARDISATION SCRIPTS BEFORE STARTING TO MARK LIVE SCRIPTS.

- 1 The schedule of dates for the marking of this paper is very important. It is vital that you meet these requirements. If you experience problems then you must contact your Team Leader (Supervisor) without delay.
- 2 An element of professional judgement is required in the marking of any written paper. Candidates often do not use the exact words which appear in the detailed sheets which follow. If you are in doubt about the validity of any answer then consult your Team Leader (Supervisor) by phone, the messaging system within scoris, or e-mail.
- 3 Correct answers to calculations always gain full credit, even if no working is shown (The “Show your working” instruction is to help candidates, who may then gain credit even if their final answer is not correct.)
- 4 Some questions may have a ‘Level of Response’ mark scheme. Any details about these will be in the Additional Guidance.
- 5 Follow the current guidance on crossed-out work.
- 6 In addition to the award of 0 marks there is a NR (No Response) option in scoris.

**Award 0 marks**

- if there is any attempt that earns no credit (including copying out the question or some crossed out working)

**Award NR (No Response)**

- if there is nothing written at all in the answer space  
OR
- if there is any comment which does not in any way relate to the question being asked (eg ‘can’t do’, ‘don’t know’)  
OR
- if there is any sort of mark which is not an attempt at the question (eg a dash, a question mark)

- 7 The **Abbreviations, annotations and conventions** used in the detailed Mark Scheme are:

**[QM to insert]**

- 8 The **Comments box** will be use by your PE to explain their marking of the practice scripts. Please refer to these comments when checking your practice scripts.

Any questions or comments you have for your Team Leader should be communicated by phone, via the scoris messaging system, or e-mail.

**9 Annotations in scoris**

The following annotations are available:

**[QM to amend/add others]**

- ✓ = correct response
- ✗ = incorrect response

Highlighting is also available to highlight any particular points on the script.

**[The following questions should be annotated with ticks to show where marks have been awarded in the body of the text: (QM to add)]**

- 10 Please send a brief report on the performance of candidates to your Team Leader (Supervisor) by the end of the marking period. The Assistant Examiner's Report Form (AERF) can be found on the RM Cambridge Assessment Support Portal.

Your report should contain notes on particular strength displayed as well as common errors or weaknesses. Constructive criticism of the question paper/mark scheme is also appreciated.

Question			Expected Answer	Mark	Rationale
1	(a)		Tough, hardwearing/long lasting/durable, less likely to splinter, good surface finish, close grain, hard,	[2]	Safe/safer must be qualified
1	(b)		Smoother finish, colour will not chip, hygienic, easy to clean, rounded edges, weight, self-coloured, wider range of colours, does not splinter, water resistant.	[2]	
1	(c)		Ease of editing, sizes set by program, repeat shapes easier, on-screen modelling, 3D evaluation possible, can be easily be transferred to CAM, accurate or precise, can be sent by email.	[2]	
1	(d)		Location by means of end stop or mark. [1] Accommodate 2 widths of beech strips [1] Method of achieving length. [1] Method of holding the beech strip <b>must be explicit.</b> [1]	[4]	Accept end/edge of jig as end stop  Allow hand held if properly supported
			<b>Total</b>	<b>[10]</b>	

Question			Expected Answer	Mark	Rationale
2	(a)		Modern design, able to store/change numerous photos, easy to change photos, stable, free standing, protects photos, economic use of materials., can be a range of colours	[2]	Must be specific features. Do not accept vague 'aesthetically pleasing'. Do not accept features that are shown in the question
2	(b)		Attractive, corrosion resistant, springy, fashionable, natural finish.	[2]	
2	(c)	(i)	Look for any stages in the process that could be used to <b>batch produce</b> including:- Marking out/development(net) Cutting to shape, include use of laser cutter, miller/router Cutting holes Use of jigs or templates Method of heating (must be explicit): strip heater/line bender/oven, Use of mould/former. CAM must be explicit Finishing, polishing edges	[4]	There are numerous stages in batch production. Candidates can achieve the maximum 4 marks by either: Details of several processes or Extended details of one process  Do not allow vacuum forming or injection moulding, but allow 1 mark for an appropriate mould for vac forming.  For maximum mark answers must include at least one sketch.  Do not allow marks for production of the rings.
2	(c)	(ii)	Award 1 mark for identifying check to be carried out <b>during</b> production. Includes checks on sizes, correct heat of plastic before bending, correct shape, quality of surface finish, stability.  Award 1 mark for describing how the check would be carried out.	[2]	Essentially 2 parts to this question. Maximum can only be awarded if both are answered correctly.
Total				[10]	

Question			Expected Answer	Mark	Rationale
3	(a)		References to appropriate body size/distance, weight of child, width/length of legs, width/height of back, reach/length of arms, etc. [2x1]	[2]	Answers that name part of the Go Kart can only be rewarded if they also refer to body sizes; eg. the width of the seat depends on the size of user's back. <b>Do not accept</b> general statements: size of child, height of child
3	(b)		Some form of metal axle: rod, screw, bolt [1]	[3]	Nail scores 0 marks. Bolt or screw fixing in to part A maximum of 1 mark only.  <b>Do not accept</b> hole drilled into the end of Part A.
			Axle fixing to part A [1]		
			Wheels securely retained on axle but freely rotate [1]		
3	(c)		Operates effectively against rear wheel: lever [1] pivot [1]	[5]	The easiest solutions would include a lever [length of wood][1] a pivot [screw or nut and bolt][1] and correct position of spring attached to lever to effect return [1].  Reward sketches that may not appear on Fig. 5 if appropriate.  <b>Do not reward</b> levers that operate against the axle.
			Includes a practical return spring mechanism. [1]		
			Details of one specific material [1]		
			Fitting or fixing used. [1]		
Total				[10]	

Question			Expected Answer	Mark	Rationale
4	(a)		Self-finished, easy to bend/malleable, does not corrode/does not rust, lightweight. [2x1]	[2]	<b>Do not accept</b> strong, attractive, cheap, durable, flexible, light (unless they are qualified/exemplified)
4	(b)		Method of securing end of aluminium rod to ensure all rods are bent at same point [1]	[3]	Accept pins, stopped hole, groove
			Method of forming 30mm radius [1]		Sketch should show a reasonable 30 mm curve, or be dimensioned <b>Do not accept</b> a right angle bend.
			Method of bending rod [1]		<b>Accept</b> hammer, mallet, and tube lever. Do not accept by hand.
4	(c)		Some form of bracket, tube, cup, for the aluminium rod. [1]	[5]	Must be a practical, workable solution.
			Support for rod to prevent dropping and jamming [1]		Allow 8mm rod in 8mm hole.
			Allowed to rotate securely(does not flop around) [1]		Fixing must be screw or bolt.(not a nail)
			Appropriate method of fixing bracket to backboard [1]		Details of materials, fitting and fixings includes: material for bracket, or essential sizes such as diameter of hole as 8mm.
			Details of one material <b>or</b> an appropriate size given. [1]		<b>Do not accept</b> wood, metal. plastic
Total				[10]	



Question			Expected Answer	Mark	Rationale
5	(a)		Piano hinge.	[1]	Piano is the only acceptable hinge.
5	(b)		Practical, viable solution for keeping the lid closed [1]		Must be a practical, workable solution. such as a hook and eye
			Solution keeps the board tightly closed on the case, yet can be easily opened by hand [1]		Magnets, straps, bands, Velcro solutions gain a maximum of 1 mark out of the 3
			Appropriate method of fixing the solution to the board <b>and</b> the case [1]	[3]	Recognised component/s or customized. Accept small screws or bolts (notes or sketches)
5	(c)		Board can be set to <b>three</b> positions [1]		In the first instance look to see if the support is a practical, workable solution: can the board be held at an angle for drawing on?
			Board is supported on <b>both</b> sides of the case [1]		If not workable, then award 0 marks for the question.
			Board is <b>secure</b> in use and will not collapse when worked on [1]		
			Ease of use. can be <b>set</b> to each position with <b>one hand</b> [1]		
			Name of a specific <b>appropriate</b> material [1]		<b>Do not accept</b> wood, metal, plastic.
			Detail of an appropriate fitting <b>or</b> fixing <b>or</b> construction [1]		<b>Accept fittings</b> , fixings or constructions
				[6]	
			<b>Total</b>	[10]	

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