OCR
RECOGNISING ACHIEVEMENT

GCSE

Design and Technology: Resistant Materials

General Certificate of Secondary Education

Unit **A564:** Technical aspects of designing and making

Mark Scheme for January 2012

Oxford Cambridge and RSA Examinations

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Annotations

Annotation	Meaning
✓	correct response
SEEN	Extended writing seen and read

Question			Answer	Marks	Guidance
1	(a)		Accept any from: Quicker than marking each shape separately. Accurate. (even if applied to cutting out) Each repeated shape will be identical. Benefits for batch production. Easier to transfer complex shape	1	Accept 'quick' at this level of question.
	(b)		Accept any from: Metal sheet can 'snag'. Hole can become distorted. Personal danger when snagged. Danger of sheet spinning. To prevent moving, slipping, bending, distorting	1	
	(c)		Dip coating, plastic coating, electroplating, chrome, zinc plating (galvanising), oil blueing/blacking.	1	Do not accept polish or varnish
	(d)		Accept any 2: Does not corrode. Does not require an applied finish. Quicker to manufacture.	2	Do **not** accept lightweight, easier to make/bend, can be recycled.
	(e)		3 parts to be satisfied: Metal held securely- vice or clamped. (1) Use of former or block. (1) Force- hammer or mallet. (1)	3	Use of bending machine, anvil or vice only (maximum 2 marks)
	(f)		Purpose is to relieve stresses, make it softer, make it easier to work/bend. Less likely to crack/break.	1	
	(g)		Methods include: Hole drilled in front to allow screw driver to fit through. Additional blocks/strips/bracket to support rack. Use of slot screwing	3	Nails = 0 marks Extending back to allow for screws (max 2 mark) Use of screws only (1 mark maximum). Allow maximum 1 mark for additional details such as hole in wall, rawl plug, size/type of screw, tools used

Question			Answer	Marks	Guidance
2	(a)		Foam board, Corriflute, Plasticard, Styrofoam, greyboard.	1	Allow corrugated card but **not** cardboard
	(b)		Locked by means of slots into which parts fit or additional parts including wedges/keys located through face of front, back or base. Award 0-2 dependent on technical accuracy	2	
	(c)		Accept any 3 from following stages: drill hole in marked out slot insert blade of coping or power saw saw out shape clean up sawn edges. (3x1)	3	Vague reference to cut out slot = 0 marks Do **not** reward any references to marking out Laser, router, miller, CAMM 2 =1 mark allow up to 2 additional marks for details

Question			Answer	Marks	Guidance	
					Content	Levels of response
	(d*)		Discussion of benefits of flat-pack, self-assembly products includes: Benefits to manufacturer: less time to manufacture because fewer processes involved, more products produced, costs kept down, competitive prices, less storage required, lower transport costs, less packaging. Benefits to consumer: lower price than ready assembled products, personal satisfaction of assembly, greater variety of products available, can transport home easier. Benefits to environment: lower production costs means less electricity used, less materials used in some products.	6	Accept answers from 1 or more areas. Minimum of 3 benefits. Minimum of 2 benefits. Identify the band that the answer fits best then decide on which of the two marks in that band.	**Level 3 (5-6 marks)** Detailed discussion of benefits of flat-pack, self-assembly products and analyses most of the issues. 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)** Some discussion of benefits of flat-pack, self-assembly products with some analysis of the issues. 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, punctuation and grammar. **Level 1 (0-2 marks)** Limited discussion of benefits of flat-pack, self-assembly products. There will be little or no use of specialist terms. Answers may be ambiguous or disorganized. Errors of grammar, punctuation and spelling may be intrusive.

Question			Answer	Marks	Guidance
3	(a)		Polystyrene, HIPS, ABS, polypropylene, PVC	1	
	(b)		Accept any 2 from: Radiused corners/edges, draft angle, smooth sides, no undercutting, air holes, height of former, appropriate material (2x1)	2	
	(c)		Accept any 4 from: clamp plastic in place pull heater across above the plastic wait for plastic to become soft remove heater to test condition of plastic raise platen /mould into plastic switch on pump to remove air switch off pump lower platen/former. (4x1)	4	Do not penalise incorrect sequence.
	(d)		Some form of tray, block or shallow box required. 1 Method of fixing base 1 Method of access to moneybox **in base**. 1 Details of materials 1 Details of constructions 1	5	The tray can be made from **any** suitable material.

Question			Answer	Marks	Guidance
4	(a)		Accept any 2 from: colour, grain, markings, quality of finish, better edges than manufactured board.	2	
	(b)		Pivot shown connecting top tray into lower tray. (0-1) Sizes include diameter/depth. (0-1) Suitable specific material: wooden or metal pin. (0-1)	3	Award 1 mark for any **one** appropriate size. Pin could be made from steel, aluminium, brass or from dowel.
	(c)		Practical solution fitting on top of tray. (1) Materials, sizes or construction. (0-2)	3	Use of applied strips/blocks to locate inside tray. Outside 0 marks. Award max. 2 marks for accurate details corresponding to any 2 of the 3 items.
	(d)		Use CAM to design Transfer data to CAM machine Method involves use of CAM machines: miller, router, laser cutter,machining centre. Wood set up in machine, parameters set, switched on, monitored, removed.	4	Award marks for each relevant item of info. up to max. 4. For maximum marks a thorough understanding must be demonstrated. Look for details re machining parameters. Accept trade names, eg. Roland CAMM2.

Question			Answer	Marks	Guidance
5	(a)		Safer in use: no small gaps where fingers could get trapped, lighter weight will not hurt so much, handles to hold, hollow shape less likely to fall out, smooth shape, no corners, more stable lower centre of gravity, sit in giving better protection.	1	Do **not** allow - no splinters
	(b)		Stainless steel.	1	No alternative.
	(c)		Method of attachment. (0-1) Additional details. (0-1)	2	Slot, bracket or 1 or 2 holes are acceptable. Allow tied rope, shaped handle
	(d)		Toboggan **A**: shell structure or similar description (1) and use of 'ribs' (1) **OR** Toboggan **B**: laminated structure (1) steam bent/lattice structure (1)	2	Do not reward use of glue and joints for Toboggan B.

Question			Answer	Marks	Guidance	
					Content	**Levels of response**
	(e*)		Comparison to include: Manufacturing method for **A**: understanding of injection moulding process. Use of tool [mould] to make the toboggan, plastic granules heated and injected into the mould. Issues include speed of production, accuracy dependent on quality of mould, lack of waste during manufacture, cost effective only for volume production. Manufacturing method for **B**: understanding of the processes involved in laminating, use of formers, glue and pressure. Understanding of processes involving screw and glue and other appropriate joints, e.g. mortise and tenon. Does not involve expensive tooling. Issues include the number of processes, time taken to carry these out for assembly, use of materials, finish required.	6	No right or wrong answer. Candidates must support their decision with facts about **both** methods. If only one method is described = Level 1- 1mark maximum. Identify the band that the answer fits best then decide on which of the two marks in that band.	**Level 3 (5-6 marks)** Detailed understanding of manufacturing methods required to compare effectively which would be the more efficient to produce in quantity. Analyses most of the issues involved. 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)** Some understanding of the manufacturing methods required to compare effectively which would be the more efficient to produce in quantity. Some analysis of the issues involved. 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, punctuation and grammar. **Level 1 (0-2 marks)** Limited understanding of the manufacturing methods required to compare effectively which would be the more efficient to produce in quantity. There will be little or no use of specialist terms. Answers may be ambiguous or disorganized. Errors of grammar, punctuation and spelling may be intrusive.

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