

Design and Technology: Resistant Materials

General Certificate of Secondary Education **A564**

Technical aspects of designing and making

Mark Scheme for June 2010

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Section A

Question		Expected Answers	Marks	Rationale
1	(a)	<p>Stage Tools/items of equipment</p> <p>1 Chinagraph pencil, marker pen, ruler, tape measure, try square, scribe, felt tip pen</p> <p>2 Hacksaw/Junior hacksaw, tenon saw, coping saw, Band Saw, Hegner or equivalent, Laser Cutter,</p> <p>3 File, wet and dry, scraper</p> <p>4 Polishing wheel, buffer, compound, acrylic polish, metal polish.</p>	[4]	<p>Stage 1 Not pen, pencil or marker</p> <p>Stage 2 Must be an appropriately named saw or CAM machine. Saw or CAM on its own = 0</p> <p>Stage 4 Do not accept wet and dry/polisher/polisher machine</p>
	(b)	<p>Method of heating: strip heater, line bender. [1]</p> <p>Details of use of former, mould or jig. [0-2]</p> <p>Method of keeping shape while cooling: clamping method. [0-2]</p>	[5]	
	(c)	Easier to drill. Bent shape more difficult to drill through.	[1]	Reference to holes being distorted not relevant.
	(d) (i)	<p>Accept any reason from those listed.</p> <p>The drill can 'snag' the acrylic.</p> <p>The acrylic can spin around the drill.</p> <p>The acrylic may crack.</p> <p>Reference to accuracy of position, size or shape of hole.</p>	[1]	
	(ii)	Accept any reason from those listed in part i.	[1]	
Total			[12]	

Question			Expected Answers	Marks	Rationale
2	(a)	(i)	Stable boards, wide boards available, specific environmental issues such as recycled/recyclable materials.	[1]	Not easy to work. Strength must be qualified.
		(ii)	Some boards liable to splinter when sawn, edges/surfaces may need covering/finishing. Unattractive appearance.	[1]	
	(b)		No trailing leads, work piece supported, clear surface below board, eye protection, glasses, blade guard, hair tied back, dust mask, ear defenders.	[2]	Accept any two. Do not accept gloves or reference to fingers. Do not accept references to clothing/apron.
	(c)		Practical method: K-D fitting, screws, wedged M&T [1] Correct position/spacing [1] Added notes. [1]	[3]	Do not accept dowels. Answers must include added notes.
	(d)		Correct method: groove, rebate, applied bead, blocks, biscuits, K-D fittings [1] Correct position/spacing [1] Added notes. [1]	[3]	Fixing through table top = max 1 mark. Answers must include added notes.
	(e)		Spray painting gives an even/smooth coat, no brush marks or hairs, more professional finish.	[2]	Accept any two. Do not accept easier, cheaper, quicker or can get into corners.
Total				[12]	

Question	Expected Answers	Marks	Rationale
3 (a)	Durable/hard wearing/ long lasting, hard, tough, close-grained, stable, high density can produce a very smooth finish, does not splinter easily	[1]	Accept any one. Do not accept non-toxic/easier to work
	(b) Name of Joint - Mortice and tenon, dowel [1] Technical accuracy of sketch: [0-2]	[3]	Sketch can be correct and name incorrect or sketch incorrect and name correct.
	(c) Stage Tools/items of equipment 1 Pencil, rule, try square, marking/mortice/cutting gauges, marking knife 2 Twist drill, saw tooth bit, bits, morticer, 3 Chisel, mallet 4 Chisel, file, glasspaper/sandpaper/abrasive paper	[4]	Must be specific names; eg do not accept 'drill' in Stage 2. Must be specific name of cutting tool
	(d) Woodworking or centre lathe/lathe/cnc router,	[1]	Do not accept sanding disc or hole saw
	(e) Method 1: engraved [1] place wood in machine and set up/transfer file/parameters [1] named machine: laser cutter, CAMM2 or equivalent. [1] OR Method 2: application of vinyl [1] place vinyl in machine and set up/transfer file/parameters/details about application of vinyl to wood [1] named machine: CAMM1 or equivalent. [1]	[3]	Two methods only. Accept answers that include detailed knowledge of process even if process is incomplete. Reward information relating to CAD transfer.
	Total	[12]	

Section B

Question		Expected Answers	Marks	Rationale
4	(a)	Cheaper for manufacture to leave unfinished. Consumer personal preference.	[1]	Accept any one.
	(b)	Practical device fits onto rails [1] Moves along dowel rails [1] Supports DVDs [1] One specific material named [1] Detail of an appropriate size of device [1]	[5]	
*	(c)	<p>Issues that may be included in an evaluation:</p> <ul style="list-style-type: none"> relatively cheap to manufacture/constructions/materials quick/easy to assemble no special skills/tools required lightweight design for transportation/carrying. <p>Level 1 (0-2 marks)</p> <p>Shows limited understanding of the issues involved when evaluating the product. 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.</p> <p>Level 2 (3-4 marks)</p> <p>Shows some understanding of the issues involved when evaluating the product with 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.</p>		<p>Different routes possible: detailed discussion of one or two points or brief mention of numerous points both valid. Be aware of repeated points.</p> <p>List of bullet points = max 2 marks</p> <p>Highlight valid points then: try to identify the band that the answer fits best then decide on which of the two marks in that band.</p>

Question	Expected Answers	Marks	Rationale
	<p>Level 3 (5-6 marks)</p> <p>Shows detailed understanding of the issues involved when evaluating the product and 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.</p>	[6]	
	Total	[12]	

Question		Expected Answers	Marks	Rationale
5	(a)	Reference to dimensions related to human body. OR Specific references to seated height of desk top, reach for depth of desk top, space for legs and knees.	[3]	Different routes possible: detailed explanation of one or two points or brief mention of numerous points both valid. Be aware of repeated points.
	(b)	Strengthened by means of a triangular plate/brace/front leg. [1] Method of joining appropriate to material stated: brazing, welding, screwing, riveting [1] Named material. [1]	[3]	Do not reward adding leg at back. Method of joining can only be rewarded if method of strengthening is appropriate.
*	(c)	Issues that may be included in an explanation: Sustainability explained through use of materials <ul style="list-style-type: none"> • MDF uses 'waste' materials • mild steel is plentiful • mild steel is relatively cheap • mild steel can be recycled. Sustainability explained through design <ul style="list-style-type: none"> • good use of materials for 'frame' of desk • instead of using 'slab' construction • parts of the desk can be disassembled and materials re-used or recycled. Sustainability explained through 6Rs (Re-use, rethink, recycle, repair, reduce, refuse) Level 1 (0-2 marks) Shows limited understanding of sustainability issues involved in the design of the computer desk. 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.		Accept either route- detailed explanations extending either of the materials or design issues or an explanation including all issues. List of bullet points = max 2 marks Highlight valid points then: try to identify the band that the answer fits best then decide on which of the two marks in that band.

Question	Expected Answers	Marks	Rationale
	<p>Level 2 (3-4 marks)</p> <p>Shows some understanding of sustainability issues involved in the design of the computer desk with 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.</p> <p>Level 3 (5-6 marks)</p> <p>Shows detailed understanding of sustainability issues involved in the design of the computer desk and 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.</p>	[6]	
	Total	[12]	

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