

Cambridge International Examinations Cambridge International General Certificate of Secondary Education

DESIGN AND TECHNOLOGY

0445/31 October/November 2016

Paper 3 Resistant Materials MARK SCHEME Maximum Mark: 50

Published

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[Turn over

Page 2 Mark Scheme Syllabus Pa						
	U	Cambridge IGCSE – October/November 2016	0445	31		
		Section A				
1	Metal can: tin[plate], [mild]steel, aluminium (1) Plastic gears: nylon (1)					
	Outdoor hinge: brass, aluminium, stainless steel (1)					
2	Awar	1 0-2 dependent upon accuracy of sketch (0–2)			[2]	
3	(a) B	ench hook, sawing board (1)			[1]	
		aw shown cutting wood held up against the bench hook ward 0–2 dependent upon accuracy of sketch (0–2)			[2]	
4	Awar	d 0–2 dependent upon accuracy of sketch (0–2)			[2]	
5	(a) E	xtrusion			[1]	
5	(a) ∟				[1]	
	(b) A	nodise, paint, lacquer, powder coat/dip coat, electroplating (2×1)			[2]	
6	Copir	n saw: small scale general woodworking processes (1) g saw: cutting curves in thin wood (1) saw: cutting metal sections (1)			[3]	
7	2 stag	jes include: set distance between spurs [with chisel], set distance from stock to first spur/pin lock stock	(2	2 × 1)	[2]	
8	(a) F	lastic: injection moulding (1)				
	(b) N	letal: die-casting, pressed (1)			[2]	
9	2 faul	ts: end splits, splits/cracks along the grain, warping, shrinkage	(2	2 × 1)	[2]	
10	(a) L	aminating			[1]	
	• •	: former, mould : [sash/F] cramp	(2	! × 1)	[2]	

Page 3		3	Mark Scheme	Syllabus	Рар	er	
			Cambridge IGCSE – October/November 2016	0445	31		
Section B							
11	(a)	2 benefits: cheaper than pre-assembled products, can be transported home, compact, satisfaction of self-assembly. (2×1)					
	(b)	Drill hole for saw blade, insert saw blade and reconnect, saw out waste, file edge smooth and flat. Power router. (3×1)				I	
		Тес	chnical accuracy (0–1)			[4]	
	(c)		thods include use of added strips or blocks [above or below] (0–2) propriate method of permanent fixing (0–2)			[4]	
	(d)	(i)	Min. 6mm–12mm max.(1)			[1]	
		(ii)	Spacing must not set dowels closer than 15mm from ends and be centrally positioned (0–2)			[2]	
	(e)	Ler Typ Nui	terial: steel or brass (1) ngth: minimum 19mm – maximum 35mm (1) be of head: countersunk (1) mber required: minimum 2 – maximum 4 (1) chnical accuracy of sketch (0–2)			[6]	
	(f)	(i) (ii)	 Explanation: B is made from 2 pieces of wood joined together and is stronger (1) A is made from a single piece with the grain weaker (1) Explanation: A would be made from a single piece of wood that would need to be cut out to shape (1))		[2]	
			The piece cut out would produce waste. (1)			[2]	
	(g)	2 p	roperties: must be hardwearing, attractive, stainproof, heatproof, wa	terproof	(2 × 1)	[2]	
12	(a)		roperties: range of colours, inherent colour, easily formed, easily wo aned easily, self-finished, attractive		(2 × 1)	[2]	
	(b)	2 it	ems of research: sizes of items to be stored, number of items, locati	on	(2 × 1)	[2]	
	(c)	2 re	easons: easier to drill while flat, quicker, more accurate, safer		(2 × 1)	[2]	
	(d)	Use	e of saw to cut shape (1) e of file to make smooth (1) rrect names of appropriate saw and file (1)			[3]	

Page 4		4	Mark Scheme		Pap	er
			Cambridge IGCSE – October/November 2016	Syllabus 0445	31	
((e)	App Me	e of strip heater or line bender (1) propriate former (1) thod of retention (1) chnical accuracy (1)			[4]
((f)	Pencils prevented from sliding: use of holes in base or additional shelf added with holes drilled for pencils to locate (0–2) Method of storing paper clips: some form of container (0–2)				[4]
((g)	(i)	1 benefit: hardwood is hardwearing, attractive, gives base weight/s	tability		[1]
		(ii)	Suitable thickness: minimum 10mm – maximum 20mm			[1]
		(iii)	Hardwood held in vice (1) Use of plane to remove waste (1) Technical accuracy of sketch/named tools and equipment (1) Power router (0–3)			[3]
		(iv)	Method of joining must include use of screws not adhesive Award 0–3 dependent on accuracy of spacing, number of screws a notes	nd added e	explana	atory [3]
13 ((a)	2 re	easons: aluminium can be shaped easily, does not corrode, lightweig	ght (2	2 × 1)	[2]
((b)	(i)	2 marking out tools: scriber, rule, try square, odd legs	(2	2 × 1)	[2]
		(ii)	Shape cut out using combination of: tinsnips, guillotine, hacksaw Award 0–3 dependent on appropriately named tools and their use.			[3]
		(iii)	Aluminium sheet held securely in vice or clamped to bench (1) Appropriate use of former (1) Method of force: mallet or hammer and scrap wood (1) Technical accuracy (1)			[4]
((c)	(i)	Description includes: holes drilled in roof and back of feeder (1) Rivet is pushed into rivet gun (1) Rivet is pushed into pre-drilled holes and trigger squeezed (1)			[3]
		(ii)	Pop riveting is quicker than traditional riveting, easier, less distortio	n		[1]

Page 5	Mark Scheme	Syllabus	Paper
	Cambridge IGCSE – October/November 2016	0445	31
(d) (i)	Award 0–3 for a practical container: appropriate size (1) appropriate shape (1) suitable method of attachment to feeder (1)		[3]
(ii)	Mould must conform to design in previous part. Draft angles (1) Rounded corners/edges (1)		[2]
	Appropriate depth (1)		[3]
(iii)	polystyrene, ABS, acrylic		[1]
(e) Pra	actical solution includes the use of some form of 'hook' (1)		
Ma	terials and fittings used (0–2)		[3]