

Cambridge Assessment International Education

Cambridge International General Certificate of Secondary Education

DESIGN AND TECHNOLOGY

0445/32

Paper 3 Resistant Materials

October/November 2017

MARK SCHEME
Maximum Mark: 50

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This mark scheme is published as an aid to teachers and candidates, to indicate the requirements of the examination. It shows the basis on which Examiners were instructed to award marks. It does not indicate the details of the discussions that took place at an Examiners' meeting before marking began, which would have considered the acceptability of alternative answers.

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Section A

Question	Answer	Marks
1	Award 0–2 dependent on technical accuracy Top and bottom plies =1 Strips shown correctly =1 Blocks drawn on 2 edges =0	2

Question	Answer	Marks
2(a)	cast iron.	1
2(b)	hard, hardwood, hardwearing. Not durable	1

Question	Answer	Marks
3	temperature	1

Question	Answer	Marks
4(a)	injection moulding, blow moulding	1
4(b)	mild steel will rust when in contact with water 1 galvanising mild steel prevents rusting 1	2
4(c)(i)	Α	1
4(c)(ii)	injection moulding is a quick process, fewer processes, mould can be reused, whereas B would require fabrication of parts taking longer to make and involve more material	1

Question	Answer	Marks
5	Award 0–2 dependent on technical accuracy. 2 curved legs = 2 with points = 1 only	2

Question	Answer		Marks
6	Joining acrylic Danger – flammable, toxic fumes, irritant to skin Prevention – ventilation, wear gloves, barrier cream, mask [any form accepted]	1	4
	Pouring molten aluminium Danger – 'spitting' of hot metal, spillages Prevention – wear visor, gauntlets, leather apron, overshoes Must be specific equipment	1	

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Question	Answer		Marks
7	A diameter/gauge of thread B length/height of screw C type of head/countersink head. Not type of screw	1 1	3

Question	Answer	Marks
8	Award 0–2 dependent on technical accuracy Tongue = 1 Groove = 1 Award 1 mark for separate tongue	2

Question	Answer	Marks
9(a)	to dry out wood, remove moisture, to minimise shrinkage/warping/rotting Minimise attack from woodboring insects	1
9(b)	kiln, artificial	1

Question	Answer	Marks
10	phenol formaldehyde 1 nylon 1	2

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Section B

Question	Answer	Marks
11(a)	The types of [suitable] outdoor materials and finishes,, constructions, appropriate dimensions to consider, the sizes of car 'boots', space saving devices to make the table compact 3×1	3
11(b)(i)	mild steel, aluminium	1
11(b)(ii)	two heat processes: soldering or brazing, welding Aluminium: award 1 mark only for welding. Award 2 marks for 2 different types of welding. 2×1	2
11(c)	Plastic laminate: heatproof, stainproof, waterproof, attractive, easier to clean. 2×1	2
11(d)(i)	Some form of hinge or pivot method Use of hinge or similar method shown without description Clear sketch [and name if appropriate] 2.00	4
	Details of materials, fittings and constructions Named material/s Fittings/constructions: e.g. award 1 mark for stating screws, named, braze 1	
11(d)(ii)	Some form of 'catch'/bracket to support end frames Accurate sketch showing method clearly Materials named 1	4
	Fittings and constructions named	
11(e)	Method to remain level0-3some form of adjustment to legs/'telescopic' principle1method of locking/securing1details of rods, pins, screws, nuts and bolts1	5
	Details of materials, fittings and constructions e.g. length of rod/pin, types of head of screw, named materials	

Question	Answer	Marks
12(a)(i)	Sliding bevel evident in sketch Correct position of sliding bevel 0–1	2
12(a)(ii)	Wide variety of saws: tenon, coping, jig, band, Hegner or equivalent	1
12(a)(iii)	Jack, smoothing plane, block	1
12(b)(i)	Nail: round wire, round, oval, panel pin	1
12(b)(ii)	Outdoor adhesive: PVA, Cascamite. Accept any appropriate trade names 1 Not superglue or Araldite [epoxy resin] Time to set must correspond with named adhesive 1	2

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Question	Answer	Marks
12(c)	Suitable hinge: butt or piano Award 0–3 dependent on technical accuracy of sketch of hinge Correctly named 0–3	4
12(d)(i)	acrylic held securely in vice or clamped to bench use of coping saw, Hegner saw or equivalent, band saw use of files to make flat and smooth 1	з
12(d)(ii)	acrylic window fitted by means of grooves or applied beads Award 0–2 dependent on technical accuracy 0–2	4
	Constructional details: tools used, sizes, processes involved 0–2	
12(e)	Method of attachment: some form of screw thread and nut to fasten parts together Award 0–3 dependent on technical accuracy Award max. 0–2 for simple bend dependent on added notes Award 1 mark for simple 'stop' Award 1 mark for details of 'stop': e.g. method of fixing to rod Award 1 mark for details of materials	3
12(f)	Problems include: climate [heat, cold, wet, wind], theft, vandalism Solutions include: weather resistant materials, protective finishes, secure mounting of products and 'vandal proof'/tough/durable materials Award 1 mark for any sensible problem identified and award 1 mark for any practical solution. 4 × 1	4

Question	Answer	Marks
13(a)	MDF is more stable, cheaper, readily available, larger sheets, easier to cut/work ${f Not}$ lighter in weight 2×1	2
13(b)(i)	Quicker, easier, accurate, repetitive accuracy	1
13(b)(ii)	Coping, band, jig, Hegner or equivalent	1
13(b)(iii)	Half-round file, round/rat tail file. Must be specific name	1
13(c)(i)	positions drawn along centre of thickness accept holes drawn in appropriate position positions for centres 20–50 mm in from each edge dimensions noted on drawing 1	3
13(c)(ii)	Ø6 or Ø9 dowel	1
13(c)(iii)	chamfer: to help guide the dowel into the hole Grooves: to provide space for the glue 1	2

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Question	Answer	Marks
13(c)(iv)	template + 2 inaccurately drawn holes shown template + 2 accurate holes shown template + 2 accurate holes shown with location in one direction template + 2 accurate holes shown with location in two directions 4	4
13(c)(v)	Quality of explanation of use 0–2	2
13(d)	Use of drill to drill out one or more holes Use of piercing saw or Hegner [with metal cutting blade] to cut out Use of files to achieve shape Correctly named tools 1	4
13(e)	MDF is unattractive without some form of opaque 'covering'. Paint used can be colourful and vibrant 1 Clear varnish would not hide the unattractive surface 1	2
13(f)	Self-assembly products popular: Can be collected and transported immediately, self-satisfaction of assembling correctly, wide range of purpose built products, good value for money/generally cheaper than some ready-assembled products 2×1	2

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