

**CAMBRIDGE INTERNATIONAL EXAMINATIONS**

Cambridge International General Certificate of Secondary Education

## **MARK SCHEME for the October/November 2014 series**

### **0445 DESIGN AND TECHNOLOGY**

**0445/32**

Paper 3 (Resistant Materials), maximum raw mark 50

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### Section A

1	<b>A</b> Mallet	1	
	<b>B</b> Chisel	1	[2]
2	<b>(a)</b> Dovetail		[1]
	<b>(b)</b> For added strength, more difficult to remove		[1]
	<b>(c)</b> Wide range available: PVA, accept trade names such as Resin W, Cascamite, animal glue		[1]
3	<b>(a)</b> Press forming/moulding, plug & yoke, injection moulding, vacuum forming		[1]
	<b>(b)</b> acrylic, polystyrene, ABS		[1]
4	<b>(a)</b> stainless steel	1	
	<b>(b)</b> duralumin	1	[2]
5	Plane to the centre and stop	1	
	Repeat from opposite end	1	
	<b>OR</b>		
	Use of scrapwood to support end grain	1	
	Plane straight across	1	[2]
6	Completed drawing of tee bridle. Award 1 mark for top, 1 for lower part, 1 for overall accuracy		[3]
7	Tenon saw	1	
	Used to cut small pieces of wood to length	1	
	Hacksaw	1	
	Used to cut small pieces of metal	1	[4]
8	<b>(a)</b> To prevent corrosion/rusting		[1]
	<b>(b)</b> Paint, galvanise		[1]

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- 9 (a) Completed drawing of back flap hinge. Award 0–2 dependent on technical accuracy. [2]
- (b) Larger surface area, screw holes staggered for additional strength [1]
- 10 (a) Used for cut lines on joints, marked waste, across grain 1
- (b) Marking, mortise and cutting gauges 1 [2]

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**Section B**

11 (a) (i) Dowel [1]

(ii) Cascamite, [waterproof] PVA, synthetic resin [1]

(b) Two reasons: speed, repetitive accuracy 2 × 1 [2]

(c)

Stage	Process	Tool or item of equipment
1	Cut off the waste	<b>Saw, chisel</b>
2	Make the hole for the mast	<b>Drill</b>
3	Make edges smooth	<b>File, glasspaper, disc sander</b>

[3]

(d) Use of screw clearly shown 1  
 Use of washers fitted appropriately 1 [2]

(e) Two properties: lightweight, water resistant, easily moulded 2 × 1 [2]

(f) Stages include:  
 set up mould/former on platen/in machine  
 lower into position  
 clamp plastic in position  
 heat plastic, check flexibility  
 raise platen/mould/former  
 turn on pump  
 wait to cool and release from mould/former

Award 0–5 for detailed stages 0–5  
 Award 0–3 for technically accurate sketches 0–3 [8]

(g) Deck must be clamped in position using G cramp  
 Award 0–2 dependent on technical accuracy. [2]

(h) Two safety precautions:  
 gloves or barrier cream to protect skin, well ventilated space, face mask,  
 goggles 2 × 1 [2]

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	(i) Two ways of making toys appealing: shape, colour, movement, noise Award 2 marks for one method well explained or 2 × 1 for two separate methods		[2]
12	(a) (i) Suitable constructions: mortise and tenon, dowel Award 0–3 dependent on technical accuracy	0–3	[3]
	(ii) Sliding bevel can be adjusted and locked at a specific angle Provides repetitive accuracy and speed	1 1	[2]
	(b) (i) 25 mm, 32 mm		[1]
	(ii) stages include: preparation/cleaning of joint apply flux position on hearth/bricks heat up metal apply spelter leave to cool  Award 0–4 for detailed stages Award 0–2 for technically accurate sketches	0–4 0–2	[6]
	(c) Some form of metal plate or block of wood attached to underside Stand joined appropriately to plate or block Accuracy of technical detail Mortise and tenon directly into underside of tray = 0–2	0–2 0–2 0–2	[6]
	(d) 2 methods: 1 mark out diagonals/circle cut off waste make round using sanding disc technical accuracy <b>OR</b> 2 faceplate turning: award 0–4 dependent on technical accuracy Stages include: prepare wood to 'octagonal' shape screw wood to faceplate set up on lathe set up tee rest turn to diameter	1 1 1 1	[4]
	(e) (i) easily wiped clean, smooth surface, does not stain, heatproof, more durable	2 × 1	[2]
	(ii) Impact/Contact adhesive. Accept trade names such as Thixofix.		[1]

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- 13 (a)** Smooth finish, consistent density, relatively easy to cut and shape, no splinters 2 × 1 [2]
- (b)** Location, items to be stored: how many, what sizes.  
Accept any sensible research item carried out before designing. 2 × 1 [2]
- (c) (i)** Use of groove or rebate. Either cut out or applied beads.  
Award 0–3 dependent on technical accuracy of drawing.  
Award 0–2 for glued/screwed inside  
Award 0 marks if base is visible 0–3 [3]
- (ii)** Partition could be pinned and glued, housing or dowelled  
Award 0–3 dependent on technical accuracy of drawing. 0–3 [3]
- (d)** Method of location for stacking:  
use of applied beads, metal pegs or wooden dowel 0–2
- Constructional details and sizes 0–3 [5]
- (e) (i)** paint, stain [1]
- (ii)** use of glasspaper, different grades, wipe off dust 2 × 1 [2]
- (f)** Due to lack of thickness, traditional joints are not practical.  
Methods should use applied strips and/or blocks to which the sides could be pinned or screwed and glued.  
Butt + glue = 1 mark. Butt + pin + glue = 1 mark. Butt only = 0. Mitre = 1 mark.  
Award 0–3 dependent on technical accuracy of drawing. 0–3 [3]
- (g)** Two functional improvements:  
more partitions for increased storage, feet to lift off flat surface,  
handholds to assist lifting.  
Accept any sensible improvement showing understanding of the term  
'functional'. 2 × 1 [2]
- (h)** Two advantages: ready coloured, easily moulded to shape, attractive colours available,  
durable material, requires no applied finish, easy to maintain/clean 2 × 1 [2]