

CAMBRIDGE INTERNATIONAL EXAMINATIONS

Cambridge International General Certificate of Secondary Education

MARK SCHEME for the October/November 2014 series

0445 DESIGN AND TECHNOLOGY

0445/31

Paper 3 (Resistant Materials), maximum raw mark 50

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Section A

- 1 (a) aluminium, steel [1]
- (b) polypropylene [1]
- (c) paint, electroplating such as chrome, dip coated plastic, powder coating, anodised [1]
- (d) protect, make appearance more attractive [1]

2

Tool	Name	Specific use
	Rip, Cross-cut, Sheet, Hand, Panel saw	Cutting wood, plastic, metal
	Inside calipers	Measuring the internal diameter of tube

4 × 1 [4]

- 3 (a) benefit of cordless electric drill:
versatile use in wide variety of situations, portable [1]
- (b) benefit of bench drill: guaranteed vertical drilling, more robust, stable, secure, more drilling power [1]
- 4 (a) tenon saw, dovetail saw [1]
- (b) bench hook or cutting board [1]
- 5 A scribe 1
B centre square 1 [2]
- 6 casting / sand casting [1]

Page 3	Mark Scheme	Syllabus	Paper
	Cambridge IGCSE – October/November 2014	0445	31

7



Award 1 mark for 3 triangles marked out as above

Award 2 marks showing waste between

[2]

8 (a) bench stop

[1]

(b) planing wood

[1]

9 Main issue is that candidates understand the importance of grain direction

(a) Award 0–2 dependent on technical accuracy

[2]

(b) Award 0–2 dependent on technical accuracy

[2]

10 (a) acetate, polystyrene, polythene

[1]

(b) can be moulded to specific shape, very secure packaging, transparent, protects product

[1]

Page 4	Mark Scheme	Syllabus	Paper
	Cambridge IGCSE – October/November 2014	0445	31

Section B

- 11 (a)** Types of garment, methods of suspending garments, door measurements: height, width and thickness, number of coats, sizes / weights of coats, 2 × 1 [2]
- (b) (i)** scribe, rule, try square 2 × 1 [2]
- (ii)** to make the marking out stand out / become clearer [1]
- (c)** 3 stages:
- use of vice or clamped in position 1
 - use of former / folding bars 1
 - method of force: hammer and scrap wood or mallet 1 [3]
- (d) (i)** Accept any 2 from:
- to bend / shape the metal
 - metal being worked can become work hardened
 - need to soften the metal for further working 2 × 1 [2]
- (ii)** 3 stages:
- heat metal 1
 - to dull red [correct temperature] 1
 - leave to cool 1 [3]
- (e)** paint, electroplated, lacquer [1]
- (f)** Accept any 3 from:
- file / filing, use of emery cloth, wet and dry [silicon carbide paper], polishing mop and compound [3]
- (g) (i)** Appropriate 'bracket' or peg 0–1
- Appropriate material 0–1
 - Appropriate sizes 0–1 [3]
- (ii)** method of joining must correspond to named materials: appropriate use of brazing, silver / hard soldering, riveting. Award marks for relevant individual stages in the process 5 × 1 [5]

Page 5	Mark Scheme	Syllabus	Paper
	Cambridge IGCSE – October/November 2014	0445	31

- 12 (a)** 2 advantages include: cheaper than solid wood, no grain direction problems, more stable as it is less likely to shrink or expand, large sheet size available 2 × 1 [2]
- (b) (i)** jig saw, router [1]
- (ii)** safety precautions include: no trailing leads, wear eye protection, follow manufacturers' instructions, make sure work is secured, ear defenders, tie hair back 2 × 1 [2]
- (c) (i)** Saw down outside of slot [tenon saw] 1
 Remove waste [chisel, coping saw] 1
 Make slot level [chisel, file] 1
 Suitability / technical accuracy of tools and equipment named 1 [4]
 No reward for marking out details.
- (ii)** use of strips of wood pinned and glued or screwed and glued under slot 0–2
 details of materials, sizes and fittings used 0–2 [4]
- (d)** Use of rod, dowel only 0–1
 Pedal secure 0–1
 Adjustable and fixed to 3 positions 0–1
 Details of materials, sizes and fittings 0–2 [5]
- (e)** Award 1 mark for general understanding of anthropometrics i.e. human measurements
 Award 2 marks for specific reference to height of child, length of legs, width of back, arm reach 2 × 1 [2]
- (f) (i)** injection moulding, blow moulding [1]
- (ii)** use of rod / axle 0–1
 method of retaining rod / axle 0–1
 secured to toy 0–1
 details of materials, sizes and fittings 0–1 [4]

Page 6	Mark Scheme	Syllabus	Paper
	Cambridge IGCSE – October/November 2014	0445	31

- 13 (a)** 3 main parts:
marking out using pencil, rule, compass
cutting the shape using a tenon saw and G clamp or use of a vibro / Hegner saw
making the edges flat and smooth using a plane, sanding disc, glasspaper
- Award 0–2 marks for each part dependent on accuracy of technical detail **[6]**
- (b)** use of 2 sash cramps 1
cramps shown over edges of top and bottom 1
use of scrap wood to distribute pressure 1 **[3]**
- (c)** use of metal rod [minimum Ø 25 mm], marbles or ball bearings fitted in a groove,
ball race 0–2
details of materials and fittings used 0–2 **[4]**
- (d)** methods include the use of strips, guides, recesses onto / into the bottom and / or the central
column
- Practical solution 0–2
Details of materials, constructions and fittings 0–3 **[5]**
- (e) (i)** white / French polish, Danish oil, wax **[1]**
- (ii)** Award 0–2 dependent on quality of answer to include as much of the following:
surfaces would be glasspapered using a cork rubber / block
various grades used getting finer through process
wipe off dust and dampen surface after each grade **[2]**
- (f)** template could be used when marking out the shape of the top, bottom or base
- jig could be used when drilling holes in the top and bottom, or when sawing the top, bottom
and base to shape 2 × 1 **[2]**
- (g)** hardwood needs to be seasoned properly so that it does not shrink or expand excessively
- understanding of seasoning evident 1
consequences of not seasoned properly 1 **[2]**