CAMBRIDGE INTERNATIONAL EXAMINATIONS

International General Certificate of Secondary Education

MARK SCHEME for the May/June 2014 series

0445 DESIGN AND TECHNOLOGY

0445/33 Paper 3 (Resistant Materials), maximum raw mark 50

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.

Mark schemes should be read in conjunction with the question paper and the Principal Examiner Report for Teachers.

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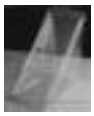
CAMBRIDGE
International Examinations

Section A

1 Left to right: panel pin round wire oval wire (3×1) [3]

2

Product	Manufacturing process	Specific plastic
 **sandwich container**	Vacuum forming	Polythene, polystyrene, HIPS
 **electrical plug**	Injection moulding	Urea formaldehyde

(4×1) [4]

3 Award 0–3 dependent upon accuracy of sketch $(0-3)$ [3]

4 **A** four jaw **B** three jaw or four jaw **C** three jaw (3×1) [3]

5 **(a)** Mild steel (1)

(b) Brass (1) [2]

6 **(a)** Hole saw / cutter [1]

(b) Interchangeable cutters, 20–75 mm Ø holes, leaves solid washer [1]

7 **(a)** Corrosive substance (1)

(b) Wear ear protection / defenders (1) [2]

8 **A** Half-round file (1)

B Square file (1) [2]

9 Use of a try square, award only 1 mark as it would be difficult inside frame
Use of diagonal measurements shown from 2 corners with appropriate notes 2 marks [2]

10 Polypropylene injection moulding (1)
Aluminium casting / die casting (1) [2]

Section B

11 (a) Tough, hard, durable, close-grained, straight-grained (2 × 1) [2]

(b) (i) 3 parts: use of vice or jig to hold steel (1)
use of vice and / or former (1)
force using hammer / scrap wood or mallet (1) [3]

(ii) Some form of 'stopper' to cover end of steel (1)
Technical accuracy of material, construction (1) [2]

(iii) Araldite or generic epoxy resin / superglue (1) [1]

(iv) Resin and hardener mixed in equal amounts (1)
application (1) [2]

(c) (i) Between centres [1]

(ii) To make it easier to achieve round shape, prevent splitting wood [1]

(iii) Chisel, gouge, scraper (2 × 1) [2]

(iv) [Outside] calipers [1]

(d) Screw shown (1)
2 washers shown in correct position (2 × 1) [3]

(e) Male and female formers shown (2 × 1)
Layers of veneers shown clearly (1)
Method of clamping (1) [4]

(f) (i) Varnish, preservative, paint [1]

(ii) 2 reasons include: to protect and preserve wood, keep clean, make attractive (2 × 1) [2]

12 (a)

Process	Tools / equipment
Mark to length	pencil, rule, try square, marking knife
Saw to length	tenon saw, vibro saw, Hegner saw, coping saw, band saw, jig saw
Make surfaces clean and smooth	plane, glasspaper, cork block / rubber

(3 × 1) [3]

(b)

Process	Tools / equipment
Mark to length	rule, try square, scriber
Saw to length	hacksaw
Make surfaces clean and smooth	Emery cloth, wet and dry (silicon carbide) paper, steel wool

(3×1) [3]

(c) Use of dowel, M&T or housing joint tee halving
Award 0 – 3 dependent on technical accuracy (0 – 3)
Name of construction to correspond (1) [4]

(d) 2 methods: use a drilling jig or clamp the 2 pieces together and mark out as one piece
Accept use of tape, panel pins to indent. Use of marking gauge 1 mark
Award 0 – 2 dependent upon technical accuracy (0 – 2) [2]

(e) Accept any 2 from:
chamfer end
saw cut / s across end
saw cut / s along length (2×1) [2]

(f) **(i)** Smoothing or jack plane [1]

(ii) Drawing of woodworkers vice (0 – 2)
Wood positioned correctly (0 – 1) [3]

(iii) Disadvantage: lack of control / moves about [1]

(g) 2 reasons include: to make attractive, to protect the material from... [qualified]
as a learning aid to colour recognition, cost effective, keep clean (2×1) [2]

(h) Mallet to be 'stored' / held against musical instrument.
Use of hole/s for mallet to fit into / through or small bracket attached to instrument
Practical idea (0 – 2)
Details of sizes, materials and constructions used (0 – 2) [4]

13 **(a)** **(i)** Chinagraph pencil, marker pen, felt tip, scriber [1]

(ii) Dividers, compass with marker pen [1]

(b) Hole drilled (1)
Blade of coping saw, vibro saw or equivalent inserted and sawn (1)
Use of file to make sawn edge smooth (1)
Accept laser cutter: award up to 3 marks dependent on additional technical information [3]

(c)

Tools/items of equipment	How they will be used
Scraper	To remove scratches along the edges of acrylic
Wet and dry (silicon carbide) paper	To produce a finer finish by rubbing along the edges of acrylic
Polishing compound	This would be applied against the mop to produce a quality finish
Polishing mop	The work piece would be applied against the mop to produce a high quality finish

(4×1) [4]

(d) Methods include the use of acrylic blocks, brackets or discs cemented to the ends of the DVD stand into which the stainless steel tube will fit

Practical solution (0–2)
Details of materials, sizes and constructions (0–2) [4]

(e) 2 ergonomic considerations include: ease of access / handling of DVDs
Ease of recognition of DVDs in stand, holes to assist lifting / moving DVD stand (2×2)
Thorough description required for maximum 2 marks for each consideration [4]

(f) Practical solution: fits onto rails (1)
moves along rails (1)
prevents DVDs falling over (0–2)
details of materials and fittings (0–2) [6]

(g) Advantages include: more durable than acrylic, will not scratch as easily, easier to construct, greater variety of constructions available (2×1) [2]