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

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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CAMBRIDGE
International Examinations

Section A

1 **A** Mallet 1
B Chisel 1 **[2]**

2 **(a)** Dovetail **[1]**

(b) For added strength, more difficult to remove **[1]**

(c) Wide range available: PVA, accept trade names such as Resin W, Cascamite, animal glue **[1]**

3 **(a)** Press forming/moulding, plug & yoke, injection moulding, vacuum forming **[1]**

(b) acrylic, polystyrene, ABS **[1]**

4 **(a)** stainless steel 1

(b) duralumin 1 **[2]**

5 Plane to the centre and stop 1
Repeat from opposite end 1
OR
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 **(a)** To prevent corrosion/rusting **[1]**

(b) Paint, galvanise **[1]**

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]**

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	**Saw, chisel**
2	Make the hole for the mast	**Drill**
3	Make edges smooth	**File, glasspaper, disc sander**

[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]**

(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 1
Provides repetitive accuracy and speed 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 0–4
Award 0–2 for technically accurate sketches 0–2 **[6]**

(c) Some form of metal plate or block of wood attached to underside 0–2
Stand joined appropriately to plate or block 0–2
Accuracy of technical detail 0–2 **[6]**
Mortise and tenon directly into underside of tray = 0–2

(d) 2 methods:
1 mark out diagonals/circle 1
cut off waste 1
make round using sanding disc 1
technical accuracy 1
OR
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 **[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]**

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 grove or rebate. Either cut out or applied beads.
Award 0–3 dependent on technical accuracy of drawing. — 0–3 — **[3]**
Award 0–2 for glued/screwed inside
Award 0 marks if base is visible

(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]**