UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS

International General Certificate of Secondary Education

MARK SCHEME for the May/June 2010 question paper

for the guidance of teachers

0445 DESIGN AND TECHNOLOGY

0445/32 Paper 32 (Resistant Materials), maximum raw mark 50

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1 **(a)** Correct shaped heads. (2 × 1) [2]

(b) One advantage: Phillips head is will not slip as easily, less chance of stripping slot, easy to put in, can be tightened more. [1]

2 Two checks: blade facing correct way [can be forwards or back dependent on material], blade tightened, pins in line, blade at correct angle. [2]

3 **(a)** Accurate tongue and groove joint. (0–2) [2]

(b) Example of use: floorboards, shed sides. [1]

4 Three safe working practices: visor/goggles worn, chuck guard down, material clamped, hair tied back, apron. Not gloves. [3]

5 **(a)** Boat: polyester resin, GRP. [1]

(b) Light switch: urea/phenol/melamine formaldehyde. [1]

6 **(a)** Accurate Tee hinge. (0–2) [2]

(b) Example of use: shed/doors, gates. [1]

7 **(a)** Cut threaded hole: tap, tap wrench. [1]

(b) Cut threaded rod: die, die stock or die holder. [1]

(c) Purpose of chamfer: to ease start. [1]

8 **(a)** Hammer: claw. [1]

(b) Reason for scrapwood: prevent damage/scratches to workpiece, increases leverage. [1]

9 Completed sketch must show countersunk head rivet on top and underneath. (2 × 1) [2]

10 Accurate bench hook. (0–2) [2]

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11 (a)

Part	Number required	Length	×	Width	×	Thickness	Material
Top	1	600	×	120	×	15	Veneered MDF
Base	1	600	×	**200**	×	15	"
Sides	2	500	×	**200**	×	15	"
Door	1	**590–600**	×	510	×	15	"
Shelf	1	600	×	**120–140**	×	15	"
Back	1	**570–600**	×	**500–510**	×	4	Plywood

Accept reverse for Back: i.e. 500 × 600 (6 × 1) [6]

(b) (i) Three components: **A:** catch, lock, magnet. Not latch or clasp.
B: stay, chain.
C: hinge. [3]

(ii) Accuracy of sketch of component. (0–2)
Method of fitting. (0–2)
Named tools/equipment. (0–2) [6]
Accept method even if component is incorrect in **(i)**.

(c) Lipping: veneer or solid wood. (1)
Method of lipping: iron-on or glue and pin shown/described. (0–2) [3]

(d) Recognisable K-D fitting. Not screw on its own or dowel. (1)
Accuracy of sketch showing position of fitting. (0–2) [3]

(e) (i) Accuracy of construction. Completed sketch = 2 max. Exploded sketch = 3 max. [3]

(ii) Named construction: housings, dowel, mortise and tenon. Not butt. [1]

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12 (a)

Stages	Tool or item of equipment
Marking out	Steel rule, scriber, try square. Not marker pen
Sawing to length	Hacksaw
Squaring sawn ends	File
Testing for squareness	Try square
Cleaning the joint	File or emery cloth
Brazing the joint	Wide variety of options inc. brazing hearth, torch, brazing rod, flux.

(6 × 1) [6]

(b) Method of holding: hinged, bracket shown clearly. Recess 1 mark max. (0–3)
Additional details, including: materials, fittings and fixings. (0–2) [5]

(c) (i) Non-ferrous metal: aluminium. Not copper. [1]

(ii) Advantage over mild steel: lighter, easier to bend, does not require a finish. [1]
Reward correct advantage even if material is incorrect in **(i)**.

(iii) Ends fitted to base by 90° bends to ends of rod. (0–2) [2]

(iv) Support made by means of former, wooden block or anvil. (0–2)
Held in a vice/clamped down. (1)
Method of force: hammer and scrapwood, mallet. (1) [4]

(d) Device: wooden strips, blocks, metal bracket, clips, slots removed from board. (0–2)
Supports and secure at 30° and 45°. (0–2)
Details to include: materials, fittings, fixings and sizes. (0–2) [6]

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13 (a) MDF more suitable than solid wood: more stable, will not shrink, no grain, cheaper. [2]

(b) Three considerations: draft angle, eased corners, no undercuts, air holes in base, smooth surfaces. [3]

(c) Former sawn from blank using coping saw, Hegner or similar. (0–2)
Former shaped using sanding disc. (1)
Reference to draft by tilting sanding disc table/workpiece. (1) [4]

(d) Specific drill for flat bottomed holes: Forstner, saw tooth [1]

(e) Slot produced:
Mark out slot with centres to drill. (1)
Drill a series of holes to 6 deep. (0–2)
Remove remaining waste with chisel or mortising machine. (0–2) [5]
Accept laser/milling machine/router.

(f) Vacuum forming process for palette.
Numerous stages include:
Place former/mould on platen [or equivalent term].
Lower platen.
Clamp plastic sheet in position.
Bring heater over plastic and heat up.
Wait until soft.
Raise platen.
Turn on pump to suck out air.
Leave to cool/remove from machine/extract from former/mould.
Accept any 6 main stages × 2 marks for additional details. [8]

(g) Modification must allow palette to be held using one hand.
Some form of finger/s, thumb grip. (0–2) [2]

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