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

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

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Section A

1 Air seasoning: more evenly dried out, less risk of defects. [1]
Kiln seasoning: quicker, can be controlled. [1]

2 Blockboard. Plywood. [2]

3 Completed drawing showing: blade attached to stock. (1)
Positioned across grain. (1) [2]

4 **(a)** Plastics suitable: hardwearing and durable, colourful, intricate details possible, lightweight, hygienic, attractive, water resistant, non-toxic. (2 × 1) [2]

(b) Injection moulding/blow moulding. [1]

5 Completed drawing to show bevel on side. (1)
Completed drawing to show bevel on end. (1) [2]

6 **(a)** Cause of cracks workhardening. [1]

(b) Prevention: anneal the steel periodically while bending, heat to soften. [1]

7 Suitable file: **A**: round/rat tail
B: warding
C: three square/triangular. (3 × 1) [3]

8 Square tube. Hexagonal bar/rod. [2]

9 Spacers/washers shown between bracket and castor. (2 × 1)
Nut threaded onto end of axle or riveted at each end. (2 × 1) [4]

10 3 stages include: turn on pump to produce fluidisation of plastic powder, heat up metal, dip into plastic, allow to cool, return to oven to reheat for smooth gloss finish. (3 × 1) [3]

Section B

11 (a) 2 benefits to manufacturer: less labour, less storage reqd. lower costs, quicker manufacture. (2 × 1) [2]

(b) 1 benefit to purchaser: lower cost, personal satisfaction, can collect. [1]

(c) Mark out (1)
Remove waste (1)
Make flat/clean up (1)
Named tools (1) [4]

(d) Avoid screws hitting each other/avoid wood grain splitting. (2 × 1) [2]

(e) 1– pilot hole. 2 – clearance hole. 3 – countersunk hole. (3 × 1) [3]

(f) (i) Reasons for three boards: width of table top cannot be made from one board. [1]

(ii) Boards arranged to counter movement caused by shrinkage. (1)
Avoid splitting. (1) [2]

(iii) Cramps used: 3 cramps (1)
evenly spaced (1)
2 on top/1 underneath or vice versa. (1) [3]

(iv) Scrap wood: distributes more even pressure, prevents damage to wood. (2 × 1) [2]

(g) (i) Prepared for finish: glasspaper along the grain, different grades of glasspaper, repeat process, wipe down between grades. (3 × 1) [3]

(ii) Suitable finish: polyurethane varnish, paint, varnish, lacquer, oil. [1]
Reason: hardwearing/stain, heat resistant. [1]

12 (a) Mild steel. [1]
Reason: fairly easy to work, takes variety of finishes, relatively cheap/plentiful. [1]
Accept valid reason even if choice in **(i)** is incorrect.

(b) Three marking out tools: scriber, rule, try square, combination square, odd leg calipers. (3 × 1) [3]

(c) Method of cutting shown: use of tin snips, guillotine, hacksaws. (0–2)
Method of holding while cutting: use of vice, scrap wood, folding bars. (0–2)
Accuracy of named tools. (0–2) [6]

(d) Use of wooden block/former. (0–2)
Force applied by means of hammer and scrap wood or mallet. (0–1)
Accuracy of named tools. (0–2) [5]

(e) **(i)** Suitable finish: paint/dipcoating. [1]

(ii) Preparation: clean with emery cloth, edges filed, surfaces degreased. (2 × 1) [2]

(f) **(i)** Modification must include some form of slot to accommodate shank of screw.
Award 0-3 dependent upon accuracy/clarity of practical design. [3]

(ii) Modification must include some form of stand.
Award 0–3 dependent upon accuracy/clarity of practical design. [3]

13 **(a)** **(i)** Completed net: 2 bend lines (2 × 1) and position for slot (1). [3]

(ii) 2 marking out tools: scriber, chinagraph pencil, felt marker, rule, try square. (2 × 1) [2]

(iii) Backing paper: protect from scratches, gives surface to mark out on. [1]

(b) 2 properties of acrylic: ready coloured, attractive, easily formed. (2 × 1) [2]

(c) 4 stages: drill holes. (1)
Saw blade to be inserted. (1)
Saw out shape of slot. (1)
File to line. (1)
Named tools. (0–2) [6]

(d) Edge finishing stages include: draw file/scraper/wet and dry different grades/polishing mop and polishing compound/polishing wheel/Perspex polish or equivalent. (3 × 1) [3]

(e) Reason for clamping: to prevent snagging, plastic will spin up the drill and then may crack. [2]

(f) Acrylic bent to shape. Main stages include:
Heat plastic using strip heater/line bender. (0–2)
Use of former. (0–2)
Retention while bending/cooling. (0–2) [6]