

**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

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 must be read in conjunction with the question papers and the report on the examination.

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Section A

- 1 Air seasoning: more evenly dried out, less risk of defects.
Kiln seasoning: quicker, can be controlled. [2]
- 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]

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Section B

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

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- (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)
- (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: scribe, 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/scrapper/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]