

**MARK SCHEME for the October/November 2008 question paper**

**0445 DESIGN AND TECHNOLOGY**

**0445/03**

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.

All Examiners are instructed that alternative correct answers and unexpected approaches in candidates' scripts must be given marks that fairly reflect the relevant knowledge and skills demonstrated.

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

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- 1 (a) Mark out line: try square/cutting gauge/markings knife.  
Do not accept pencil, rule, T-square, marking gauge.
- (b) Remove waste: tenon saw/back saw/chisel. [1]  
Do not accept saw, coping saw.

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Product	Method of preventing corrosion
garden gate	<b>paint not lacquer</b>
dustbin	<b>galvanise</b>
wire shelves in a fridge	<b>dip/plastic coat/fluidise</b>

[3]

- 3 (a) Process: lamination. Do not accept steaming. [1]
- (b) Advantage: ability to form shapes accurately/increased strength/any reference to being bent easily, bent to required shape.  
Strength must be qualified. [1]

- 4 Two features: rounded edges/corners, tapered sides/smooth mould. [1]  
Accept vent holes even though not part of mould. [1]

- 5 (a) Damage: possible splitting in half or splits on back caused by bit. [1]  
Accept splinter/chip. Do not accept scratch.
- (b) Minimised: turn wood upright or support back with scrap wood. [1]  
Accept place wood flat and drill downwards.

- 6 Quality and accuracy of correct joint. (0–3) [3]

- 7 Plastic memory: ability to return to its original form/state. (1)  
Plastic memory: heat treatment. (1) [2]  
Heated and reshaped repeatedly, award 1 mark only.

- 8 Safe edge has no teeth. (1)  
Safe edge cannot remove material on upright surface. (1) [2]  
Maximum marks can be awarded without reference to no teeth on safe edge.

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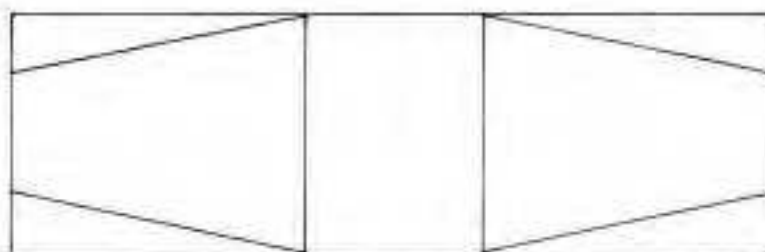
- 9 (a)** Copper is annealed to make it softer and easier to work.  
Accept reference to enable bending or shaping copper.
- (b)** Copper annealed by heating it up 500–600 °C or dull red. (1)  
Award 1 mark for any reference to heating the copper.  
Copper is then allowed to cool slowly. (1) [2]
- 10 (a) A** tool rest. [1]  
Accept tool stand/chisel support.
- B** tailstock. [1]  
Accept dead centre.
- (b)** Two stages in preparation: mark out centres on ends/draw circle on ends [1]  
saw cut on one end for fork centre/punch or drill holes in ends/plane off edges. [1]  
Accept reference to making it round/removing square edges.
- 11 (a)** Three properties of acrylic: easily moulded into shape, easily machined, [1]  
easily joined, clear and opaque varieties available, impact resistant, [1]  
attractive colours. [1]  
Do not accept: hard to break, strong, easy to use, durable.
- (b) (i)** Two marking out tools: dividers, centre/dot punch, chinagraph pencil, compasses, rule, [1]  
marker pen, felt tip. [1]  
Do not accept: marker, scriber, pencil. [1]
- (ii)** Two tools used to remove waste: tenon saw, Hegner saw, Scroll saw, [1]  
coping saw, file, sanding disc, belt sander, abra file, fret saw, hacksaw, [1]  
laser cutter, band saw.  
Do not accept: jig saw.
- (iii)** Two tools used to finish/polish: file, wet and dry paper, scraper, [1]  
polishing mop, compound, metal polish, acrylic polish. [1]  
Do not accept: emery cloth.
- (c) (i)** Plastic clamped down because: the drill can ‘snag’ in the work piece. (1)  
Can result in plastic cracking, breaking, ruining acrylic. (1) [2]
- (ii)** Accuracy/quality of sketch. (0–2) [2]  
Do not accept holding in machine vice.
- (d) (i)** Cover made by vacuum forming. (1)  
Plastic must be heated/vacuum forming machine (1)  
Plastic clamped down (1)  
Use of former/mould (1)  
Air sucked out (1) [4]

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- (ii) Cover made by blow moulding. Accept any 4.
  - Heated plastic (1)
  - Plastic clamped down (1)
  - Use of former/mould (1)
  - Clamping ring (1)
  - Air blown in (1) [4]

- (e) Method includes use of screws/nuts and bolts/‘clips’. (0–2)
- Accept pop rivet. (0–2)
- Accuracy/quality of sketch. [4]

- 12 (a) (i) Left end marked out correctly. (1)
- Right end marked out correctly. (1)
- Base end marked out correctly. (1) [3]



- (ii) Pencil lines used on bends to avoid marking finished work. (1)
- Scriber used to mark out sawn lines. (1) [2]

- (iii) Saws include hacksaw, junior hacksaw, Abra file. [1]

- (iv) File: flat or hand. [1]

- (b) Holding sheet: vice and folding bars, former. H (2)
- Force required: hammer, mallet. F (1)
- Accuracy/quality of sketch. A (0–2) [5]

- (c) (i) Range of stages available including: fine sand over pattern in drag, turn over drag and fit cope, use of parting powder, fill with sand, cut pouring basin for runner, cut gates, tap and remove pattern, blow away loose sand, pour molten metal. (0–4) [4]

- (ii) Wear specific items of protective clothing, adult to supervise pouring, Accept apron, eye protection. [1]
- [1]

- (d) Method of fixing by screws. (1–2)
- One screw or two screws. (1) [3]
- Appropriate type of head identified.
- Use of nuts and bolts is fine but maximum marks only if nuts set in.

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- (e) (i) Self-finished means that no finish is applied to the product and that the material can be cleaned and polished without application of a finish. (1)
- (ii) Draw file, filing. (1)  
 Wet and dry paper, emery cloth. (1)  
 Polishing mop and compound. (1) [3]

13 (a) Cutting list completed: 1 mark for each correct entry. [6]

Part	Number required	Sizes					Material
		Length	×	Width	×	Thickness	
top and bottom	2	500	×	150	×	19	oak
bookcase sides	2	500	×	150	×	19	oak
shelves	2	460–500	×	120–140	×	15	oak
back	1	580–600	×	480–500	×	6	plywood

(b) (i) Accuracy/quality of drawing of appropriate joint. (0–3) [3]  
 Mitre only 1 mark. For maximum 3 marks must show method of reinforcement.

(ii) Correct name: rebate, finger/comb, dovetail, dowel, mitre. [1]

(c) Adjustable +/-20mm. **A** (1)  
 Strength of method shown. **S** (1)  
 Ease of adjustment. **E** (1)  
 Details of materials/fittings. **D** (0–2) [5]  
 For maximum 2 marks details must be given: sizes, materials.

(d) (i) Glass doors slide between grooves cut into top and bottom sides, or between applied runners. **G** (0–2)  
 1 groove shown = 1 mark, 2 shown = 2 marks.

Removal by means of grooves or runners in top side being twice the depth of those in the bottom side. **D** (0–2) [4]

(ii) Sliding doors take up less space. [1]  
 Do not accept can be removed for cleaning.

(e) Range of stages available including: cabinet scraper, medium glasspaper, wipe down between grades, fine glasspaper, apply polyurethane varnish and allow to dry, rub down between coats, flour paper. (0–5) [5]  
 Apply coat of varnish and wait to dry is one stage only.