

MARK SCHEME for the May/June 2008 question paper

0445 DESIGN AND TECHNOLOGY

0445/03

Paper 3 (Resistant Materials), maximum raw mark 50

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- 1 (a) Marking gauge. [1]
- (b) Jack or trying plane. [accept plane only] [1]
- (c) Rule or straight edge. [1]

2

Item	Finish	Reason
Saucepan	PTFE (Teflon)	Non-stick
Bucket, watering can, bin, gate, nails, screws, bolts, chains	Galvanised	Prevents rust
Copper jewellery	Clear lacquer, "Ercolene", enamel	Hard, colourful and protective

[3]

3 Clear acrylic rod joined by means of Tensol, acrylic cement, plastic cement. [1]

4 One benefit includes: no need to clamp / immediate joint. [1]

- 5 Above datum = 10 mm [1]
 Below datum = 0.5 mm [1]
 Highest line on thimble below datum = 0.16 [1]
 Reading = 10.66 [3]

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

7 Wing nut can be tightened by hand without use of spanner, easier to undo. [1]

Hexagonal nut can have great pressure applied using a spanner, can be screwed on tight. [1]

8 (a) Advantage of spray: more consistent / smoother finish / no brush strokes, covers wider area, no hairs from brush. [1]

(b) Safety precaution: well ventilated room / face mask / goggles. [1]

9 Bevel-edge chisel. [1]

10

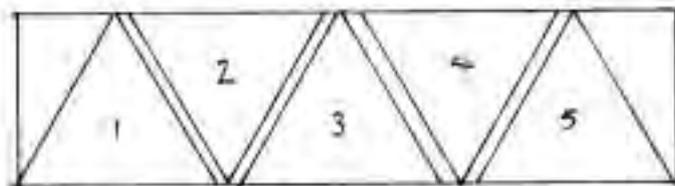
Plastic product	Process	Material
 cap off a toothpaste tube	Injection moulding	ABS polypropylene HDPE cellulose acetate
 egg carton	Vacuum forming	polythene polystyrene
 lemonade bottle	Blow moulding	HDPE

[6]

- 11 (a) Two advantages include: self finished, colour inherent, attractive. (1) [1]
- (b) Two benefits include: speed, accuracy, saves space, saves material. (1) [1]
- (c) (i) Locate jig to shelf. (1)
 Position for holes located/drilled. (1)
 Secure while drilling. (1) [3]
- (ii) Safety feature must relate to use of the jig. [1]
 Award feature even if jig is inappropriate.

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(d) (i)



Tessellating shapes. (1)

Waste between shapes. (1)

Accuracy/proportion. (0–2)

[4]

(ii) Chinagraph pencil mark can be erased, scribe makes a scratch in surface. (1)

[1]

(iii) Method of holding: vice, G cramp, bench hook. (1)

Correctly named saw: vibro, Hegner, tenon, coping, hacksaw. (1)

Accuracy/quality of answer. (0–2)

[4]

(iv) 4 stages include: draw filing, scraper, wet and dry paper, polishing compound/wheel. (4x1)

[4]

(e) Use of 'spacer' or similar technique. Accept interference fit. (1)

Details of how 'spacer' is constructed into rack. (1)

Quality/accuracy of design. (0–2)

[4]

12 (a) Mild steel will give stability for the base. (1)

[1]

Aluminium is light and will allow the wind to blow the wind flap. (1)

[1]

(b) (i) Annealing alters the internal structure of the metal, relieves internal stresses and softens the metal so that it can be worked. (2)

[2]

(ii) Steel is heated. (1)

Steel is allowed to cool. (1)

[2]

(iii) Use of vice or anvil. (1)

Use of former and hammer/mallet. (1)

Accuracy/quality of sketch. (0–2)

[4]

(c) (i) End of rod tapered. (1)

Die and dieholder. (1)

Method: cut and turn back. Accept taper tap followed by second tap. (1)

[3]

(ii) Tapping size drilled hole in base. (1)

Tap and tap wrench. (1)

Method: cut and turn back. (1)

[3]

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- (d) Nut and washer or rivet, split pin, rubber stopper, mushroom end over. (1)
Accuracy/quality of sketch. (0–2)
- (e) (i) Tin snips or abra file saw. [1]
(ii) Half round file. [1]
- (f) ‘U’ bracket or similar riveted using countersunk rivets/pop rivets/machine screws. (0–3)
[Glue or soldering only = 0 marks.]
Non-protrusion on scale side. (1) [4]
- 13 (a) Two advantages include: hardwearing, colourful, inherent colour, no splinters, will not warp or rot, non toxic, more child friendly. (1) [1]
- (b) Two advantages include: quicker to produce, more accurate, easier to finish, no need to use a milling machine or router, easier to construct. (1) [1]
- (c) Correctly named saw: coping, Hegner, Scroll. (1)
Correct method of sawing: drilling hole large enough for saw blade to enter. (1)
Edges smoothed by means of a file. (1)
Safety precaution appropriate to relevant process. (1)
Accuracy/quality of sketch. (0–2) [6]
- (d) (i) Adhesive applied by brush or thin stick evenly over both surfaces. [1]
(ii) Pieces held together by G cramps, vice, weights on top. [1]
(iii) Approximate setting time 1–3 hours. [1]
- (e) (i) Level with top. (1)
Means of support: rebate, applied bead – correct principle. Use of router. (1)
Accuracy/quality of sketch. (0–2) [4]
(ii) Quality of drawing showing appropriate joint. [3]
(iii) Appropriately named joint: rebate, mitre, dowel, finger or comb, dovetail. [1]
(iv) Two marking out tools include: pencil, rule, try square, marking/cutting gauges. [1]
Accept any correct tool appropriate to the joint shown in (i). [1]
(v) Two cutting tools include: tenon/dovetail saws, chisel, coping saw. [1]
Accept any correct tool appropriate to the joint shown in (i). [1]
Accept holding tools: cramps, bench hook, vice if appropriate.
If joint is inappropriate in (ii) award marks for correct tools in parts (iv) and (v).