

CAMBRIDGE INTERNATIONAL EXAMINATIONS

Cambridge International General Certificate of Secondary Education

MARK SCHEME for the October/November 2015 series

0445 DESIGN AND TECHNOLOGY

0445/33

Paper 3 (Resistant Materials), maximum raw mark 50

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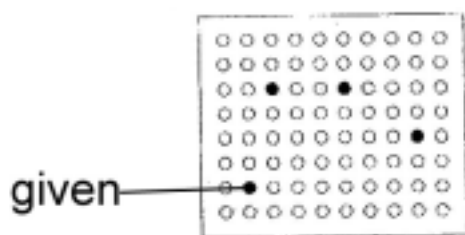
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Section A

- 1 (a) (i) Length shown along whole of screw (1)
- (ii) Length shown from under round head (1) [2]
- (b) Gauge is the diameter of the screw thread [1]
- 2 (a) Acrylic, 'perspex', polystyrene, ABS [1]
- (b) Two properties: easily moulded to shape, weather resistant, inherent colour, durable, lightweight, transparent, translucent (2 × 1) [2]
- 3 Completed drawing of G cramp.
Award (0–2) dependent on technical accuracy [2]
- 4 Plane off sharp edges using a plane/Surform/rasp/file (1)
Finish with glasspaper (1) [2]
Use of router with appropriate shaped cutter (0–2)
- 5 (a) Vacuum forming, injection moulding [1]
- (b) For added strength and rigidity [1]
- 6 (a) [sand] Casting [1]
- (b) Aluminium, brass, iron [1]
- 7 (a) Polystyrene, styrofoam [1]
- (b) Two advantages: much quicker to produce, can be moulded to exact shape, more comfortable, additional shaping not required (2 × 1) [2]
- 8 Completed drawing of jaws: 2 'vees'
Award (0–2) dependent on technical accuracy [2]

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- 9 Award 3 marks for each correct peg position (3×1) [3]



- 10 A Blowtorch (1)
 B [fire] Bricks, hearth (1)
 C Solder (1) [3]

Section B

- 11 (a) Two tools: marker pen, rule, try square (2 × 1) [2]
- (b) Two precautions: correct drill speed, sheet clamped down, supported underneath (2 × 1) [2]
- (c) Stages include:
 Heat plastic on strip heater/line bender (1)
 Shape around a mould/former (1)
 Retain in position while plastic cools down (1) [3]
- (d) Notes to include: plastic granules fed into hopper, a screw moves them along the chamber, heated to make soft, forced through a die of the required shape (4 × 1) [4]
- (e) Practical idea: partition of appropriate length and height shown on base (0–2)
 Constructional details (0–2)
 Sizes (0–1) [5]
- (f) Hooks sawn to length using hacksaw and held in vice, tenon saw and bench hook, Scroll/Hegner saw without vice (0–2)
 Sawn ends filed (1) while held in vice (1) (0–2)
 Hooks cemented into holes (0–1) [5]
- (g) Some form of bracket attached to the wall and back of rack, extended back folded and slotted (0–2)
 Constructional details and sizes (0–2) [4]
- 12 (a) Figure and grain, colour, stability (2 × 1) [2]
- (b) To prevent the wood from shrinking, twisting, warping [1]

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- (c) (i) To hide the unattractive edges and make it look like solid wood, less likely to chip [1]
(ii) Solid wood or [iron-on] veneer [1]
- (d) Mortise and tenon, dowel
Completed drawing of joint: award (0–3) dependent on technical accuracy [3]
Named joint to correspond with sketch must be appropriate [1]
- (e) (i) Jack or smoothing plane [1]
(ii) Leg shown at an angle in vice so that planing is horizontal
Vice drawn (1)
Leg at an angle (1) [2]
- (f) Methods include: counterbored hole for screw, pocket screw, wooden button, shrinkage plate, KD fitting, dowelled from underneath
Appropriate method (1)
Technical accuracy of sketch (0–3) [4]
Any holes through top = 0 marks
- (g) (i) Stages include:
Drill hole for saw blade (1)
Cut out shape using a Scroll saw [or equivalent], jig saw (1)
Make smooth using a [small] plane, e.g. block plane and files (1)
Technical accuracy of method/sketch (0–1)
Allow router: for maximum marks details must be provided [4]
(ii) Beads along all 4 edges (1)
Pinned or screwed and glued to edges (1)
Appropriate sizes (1)
OR
Rebated edges (1)
Method of producing rebate (1)
Appropriate sizes (1) [3]
- (h) Environmentally friendly:
using wood that can be replaced, reforestation, using recycled wood based materials [2]

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- 13 (a) (i)** Scribe, try square, rule, odd-legs, engineers blue (2 × 1) [2]
- (ii)** Three stages:
 Drill hole to insert blade of abra file, jig saw, Scroll saw [with metal cutting blade],
 cold chisel
 Cut out waste
 File flat and smooth
 Award (0–2) marks for each stage shown clearly (3 × 2) [6]
- (b) (i)** Plastic/dip coated, [spray] painted [1]
- (ii)** Stages include: clean surface of metal, use of at least 2 different grit wet and dry [silicon carbide] paper, use of polishing mop with appropriate compound [3]
- (c)** Stages include: use of former around which sheet metal will be shaped, held in position while bent using a soft-faced mallet or hammer and scrapwood
 Former (1)
 Held in position (1)
 Method of force (1)
 Technical accuracy (1) [4]
- (d)** Modification to existing rack allows for quick and easy connection:
 Clips, slides, overlaps (0–2)
 Details of materials and sizes (0–2) [4]
- (e)** Modification will include some method of lifting the edges off the polished surface or will cover the edges with a material that will not scratch, folded edges
 Appropriate modification (0–2)
 Details of materials and constructions (0–2) [4]
- (f)** Reason for limited lifetime is that DVDs will become obsolete as new technologies are developed [1]