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 should be read in conjunction with the question paper and the Principal Examiner
Report for Teachers.

Cambridge will not enter into discussions about these mark schemes.

Cambridge is publishing the mark schemes for the May/June 2015 series for most
Cambridge IGCSE®, Cambridge International A and AS Level components and some
Cambridge O Level components.
Section A

1 Three safety precautions: visor, work clamped, chuck guard, apron, fingers behind work, hair back, no loose jewellery
   NOT ear defenders 3×1

2 Two advantages of chipboard: stable/will not warp, cheaper than solid wood, availability, wide boards, recycled wood, fewer defects, can be veneered to look like solid wood, environmentally friendly
   NOT durable, easy to work, doesn’t splinter, stronger, cheap 2×1

3

<table>
<thead>
<tr>
<th>Use</th>
<th>Adhesive</th>
</tr>
</thead>
<tbody>
<tr>
<td>gluing plastic laminate to a manufactured board table top</td>
<td>Impact / contact adhesive, ‘Thixofix’</td>
</tr>
<tr>
<td>wooden boat building</td>
<td>Synthetic resin, ‘Cascamite’, waterproof PVA</td>
</tr>
<tr>
<td>gluing metal parts together</td>
<td>Epoxy resin, ‘Araldite’ NOT superglue</td>
</tr>
</tbody>
</table>

4 aluminium comb: anodised 1
   NOT self-finished, electropolishing
   wooden chopping board vegetable/olive oil / no finish 1
   NOT teak oil
   handle of junior hacksaw: plastic / dipcoated/ powder coat 1

5 Two advantages of die casting: intricate designs possible, reusable moulds, little or no machining necessary, fast process, identical multiple parts, mass production possible
   NOT accurate, water resistance 2×1

6 Riveting / pop riveting 1

7 (a) stronger, avoid splitting, more stable 1
   (b) round wire, French wire, oval wire/brad, panel pin 1
   (c) pincers, claw hammer 1

8 Completed marking out of mortise and tenon joint.
   1 mark = tenon, 1 mark = mortise, 1 mark correct spacing 3×1
   Award 1 mark for drawing of completed M&T joint

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<table>
<thead>
<tr>
<th></th>
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<th></th>
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</thead>
<tbody>
<tr>
<td>9</td>
<td>A</td>
<td>facing off</td>
<td>B</td>
</tr>
<tr>
<td>10</td>
<td>Food tray</td>
<td>polypropylene, GRP, melamine</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Plumbing pipe</td>
<td>MDPE, polythene, PVC, ABS</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Curtain track</td>
<td>nylon, polypropylene, polythene</td>
<td>NOT HDPE</td>
</tr>
</tbody>
</table>
Section B

11 (a)  [4]

<table>
<thead>
<tr>
<th>Stage</th>
<th>Tool / item of equipment</th>
<th>Use</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Scriber</td>
<td>Mark lines to be sawn</td>
</tr>
<tr>
<td>2</td>
<td>Hegner or scroll saw</td>
<td>Cut off waste</td>
</tr>
<tr>
<td>3</td>
<td>Hand file</td>
<td>Make edges flat / smooth / accurate shape</td>
</tr>
<tr>
<td>4</td>
<td>Wet and dry paper</td>
<td>Fine finishing</td>
</tr>
</tbody>
</table>

(b) Two safety precautions: well-ventilated area, face mask, gloves or barrier cream, safety glasses, use tool to apply it  2\×1

NOT apron

(c) Two properties of aluminium: easily bent, self-finished, attractive, malleable

NOT does not rust, waterproof, lightweight, durable

(d) Award 3\×1 stages: Do not reward marking out

- Drill hole 1
- Insert abra file blade, Hegner saw [or equivalent] piercing saw to saw to line 1
- File flat and smooth 1
- Technical accuracy: 2 correctly named tools / equipment 0–2

Use of cold chisel/hacksaws/ tinsnips: award maximum 4 marks

NOT laser cutter

(e) Correct sequence of stages include:

degrease, steel wool, wet and dry [medium grit], wet and dry [fine grit], polishing mop, polishing compound, metal polish [Brasso]  3\×1

NOT use of files, emery cloth, applied finishes

(f) Wooden former / jig / folding bars required 1

Method of securing former / jig 1
Application of force: mallet or hammer and scrap wood 1
Ease to batch produce 1
Technical accuracy 1

NOT use of bending machine
(g) (i) CAD accuracy, ease of editing, on-screen modelling, send designs electronically to clients, fully dimensioned drawings, can be outputted to linked machines NOT quicker, faster [2]

(ii) CAM consistent quality, repetitive accuracy, quicker production times, complex shapes can be created, minimum waste [2]

12 (a) Durable, hardwearing, water/weather resistant, attractive, tough [1]

(b) Wide range of hardwoods available: elm, oak, mahogany, teak and softwoods including Douglas fir, cedar, pine 2×1

NOT beech

(c) Paint, wood preservative, polyurethane varnish, oil, teak oil, lacquer 2×1

NOT beeswax

(d) Modifications include added handles, cut out hand holds, rope and drilled holes Practical idea 0–2

Details of materials used AND/OR method of construction 0–2

(e) (i) For maximum 4 marks for each, full details must be provided and must be appropriate to the specific parts of the planter [12]

Wood screws:
rail---leg     rail---base     lower side---base

NOT sides---ends     leg---lower side

Nuts and bolts:
rail---leg     rail---base

Dowels and adhesive:
top side---lower side     sides---ends     leg---lower side     rail---base

Look for technical accuracy, appropriate construction 3×4

Award 1 mark if only the parts of the planter are shown

(ii) Stages include: [4]

Top and lower sides to ends
Top side to lower sides
Rails to legs
Rail to base
Leg to lower side
Base to ends and/or lower sides
Rails and legs to base

Correct sequence not essential as the parts can be assembled in different ways.
13  (a) Award 3 areas of research identified: [3]

Available resources/materials
Relevant sizes of magazines, types and quantity required. Allow sizes only once.
User preferences
Location/environment
Costs
Existing products

**NOT** weight of magazines

(b) speed, accuracy, awkward shapes can be repeated quickly, fewer mistakes means less waste [2]

2×1

(c) (i) heated by means of strip heater/line bender [3]
use of former to bend around 1
retain while acrylic cools 1

**NOT** left under water to cool

(ii) the oven heats the whole of the acrylic making it difficult to achieve the sharp bend achieved by either the strip heater or the line bender 1 [2]

(d) (i) Principle is to use some form of jig or to tape the strips together. [2]
After using one strip use it as a measure for next strip.
Award 0–2 marks dependent on technical appropriateness.

**NOT** laser cutter, template

(ii) Award 0–2 marks for showing how the strips could be fixed and equally spaced [4]
Award 0–2 marks for showing how the strips would be held while the cement sets
Equal spacing requires some form of spacer the same size as the strip 0–2
Method of fixing in position using cramps 0–2

**NOT** use of a rule to measure gap

(e) (i) Ends shaped and made from specific named manufactured board: [6]
plywood, MDF 0–2

Strips shaped and made from specific named solid wood: wide variety available 0–2

**Methods of construction:** use of pins and/or screws with glue 0–2

Award maximum 3 marks for total redesign
(ii) Answers may include reference to specific points including:

Some plastics are not recyclable

Plastics are not biodegradable
Plastics made from oil, finite source
Plastics give off poisonous fumes during manufacture

Wood used to manufacture can be replaced
Woods can be recycled into manufactured boards

Award 1 mark for each relevant point made 0–3 [3]