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.

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Section A

1 Metal can: tin[plate], [mild]steel, aluminium (1)
   Plastic gears: nylon (1)
   Outdoor hinge: brass, aluminium, stainless steel (1)

2 Award 0-2 dependent upon accuracy of sketch (0–2)

3 (a) Bench hook, sawing board (1)

   (b) Saw shown cutting wood held up against the bench hook
   Award 0–2 dependent upon accuracy of sketch (0–2)

4 Award 0–2 dependent upon accuracy of sketch (0–2)

5 (a) Extrusion

   (b) Anodise, paint, lacquer, powder coat/dip coat, electroplating (2×1)

6 Tenon saw: small scale general woodworking processes (1)
   Coping saw: cutting curves in thin wood (1)
   Hacksaw: cutting metal sections (1)

7 2 stages include:  set distance between spurs [with chisel],
   set distance from stock to first spur/pin
   lock stock
   (2 × 1)

8 (a) Plastic: injection moulding (1)

   (b) Metal: die-casting, pressed (1)

9 2 faults: end splits, splits/cracks along the grain, warping, shrinkage
   (2 × 1)

10 (a) Laminating

   (b) A: former, mould
   B: [sash/F] cramp
   (2 × 1)
Section B

11 (a) 2 benefits: cheaper than pre-assembled products, can be transported home, compact, satisfaction of self-assembly. \( (2 \times 1) \) \[2\]

(b) Drill hole for saw blade, insert saw blade and reconnect, saw out waste, file edge smooth and flat. Power router. \( (3 \times 1) \)

Technical accuracy (0–1) \[4\]

(c) Methods include use of added strips or blocks [above or below] (0–2)

Appropriate method of permanent fixing (0–2) \[4\]

(d) (i) Min. 6mm–12mm max.(1) \[1\]

(ii) Spacing must not set dowels closer than 15mm from ends and be centrally positioned (0–2) \[2\]

(e) Material: steel or brass (1)
Length: minimum 19mm – maximum 35mm (1)
Type of head: countersunk (1)
Number required: minimum 2 – maximum 4 (1)

Technical accuracy of sketch (0–2) \[6\]

(f) (i) Explanation:

B is made from 2 pieces of wood joined together and is stronger (1)
A is made from a single piece with the grain weaker (1) \[2\]

(ii) Explanation: A would be made from a single piece of wood that would need to be cut out to shape (1)
The piece cut out would produce waste. (1) \[2\]

(g) 2 properties: must be hardwearing, attractive, stainproof, heatproof, waterproof \( (2 \times 1) \) \[2\]

12 (a) 2 properties: range of colours, inherent colour, easily formed, easily worked, cleaned easily, self-finished, attractive \( (2 \times 1) \) \[2\]

(b) 2 items of research: sizes of items to be stored, number of items, location \( (2 \times 1) \) \[2\]

(c) 2 reasons: easier to drill while flat, quicker, more accurate, safer \( (2 \times 1) \) \[2\]

(d) Use of saw to cut shape (1)
Use of file to make smooth (1)
Correct names of appropriate saw and file (1) \[3\]
(e) Use of strip heater or line bender (1)
   Appropriate former (1)
   Method of retention (1)
   Technical accuracy (1)  [4]

(f) Pencils prevented from sliding: use of holes in base or additional shelf added with holes drilled for pencils to locate (0–2)
   Method of storing paper clips: some form of container (0–2)  [4]

(g) (i) 1 benefit: hardwood is hardwearing, attractive, gives base weight/stability  [1]
(ii) Suitable thickness: minimum 10mm – maximum 20mm  [1]
(iii) Hardwood held in vice (1)
   Use of plane to remove waste (1)
   Technical accuracy of sketch/named tools and equipment (1)
   Power router (0–3)  [3]
(iv) Method of joining must include use of screws not adhesive
   Award 0–3 dependent on accuracy of spacing, number of screws and added explanatory notes  [3]

13 (a) 2 reasons: aluminium can be shaped easily, does not corrode, lightweight  \((2 \times 1)\)  [2]

(b) (i) 2 marking out tools: scriber, rule, try square, odd legs  \((2 \times 1)\)  [2]
(ii) Shape cut out using combination of: tinsnips, guillotine, hacksaw
   Award 0–3 dependent on appropriately named tools and their use.  [3]
(iii) Aluminium sheet held securely in vice or clamped to bench (1)
   Appropriate use of former (1)
   Method of force: mallet or hammer and scrap wood (1)
   Technical accuracy (1)  [4]

(c) (i) Description includes: holes drilled in roof and back of feeder (1)
   Rivet is pushed into rivet gun (1)
   Rivet is pushed into pre-drilled holes and trigger squeezed (1)  [3]
(ii) Pop riveting is quicker than traditional riveting, easier, less distortion  [1]
(d) (i) Award 0–3 for a practical container:
   appropriate size (1)
   appropriate shape (1)
   suitable method of attachment to feeder (1)  [3]

(ii) Mould must conform to design in previous part.
    Draft angles (1)
    Rounded corners/edges (1)
    Appropriate depth (1)  [3]

(iii) polystyrene, ABS, acrylic  [1]

(e) Practical solution includes the use of some form of ‘hook’ (1)

   Materials and fittings used (0–2)  [3]