UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS

International General Certificate of Secondary Education

MARK SCHEME for the May/June 2012 question paper

for the guidance of teachers

0445 DESIGN AND TECHNOLOGY

0445/33 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, which would have considered the acceptability of alternative answers.

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

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UNIVERSITY of CAMBRIDGE
International Examinations

Section A

1 To make a small hole in wood to start a screw [1]

2 **(a)** PVA used to glue any type of wood construction, wood to wood [1]

(b) Epoxy resin used to glue combinations of materials such as wood to metal, wood to glass, metal to glass, metal to metal [1]

(c) Contact used to glue plastic laminates, wood to wood quickly without aid of cramps, plastic to plastic, flexible materials [1]

3 Minimum 3 plies shown. Alternate grain shown with even/odd number of plies: [2]

4 [3 jaw] chuck [revolving] centre knurling tool (3 × 1) [3]

5 Accuracy of completed joint (0–3) [3]

6 **(a)** Dries very quickly, glues variety of materials. [1]

(b) Any precaution relating to possible risk of burns, apron, gloves, don't touch hot glue, turn off after use. [1]

7 Accuracy of completed drawing to show 2 legs inside tube (0–2) [2]

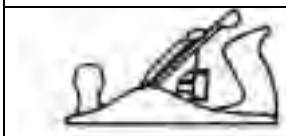
8 **(a)** Causes: mould too deep, plastic too hot [1]

(b) No air vents, undercuts, insufficient heat, mould stuck to plastic, air bubbles trapped, overstretched after multi-use [1]

9 **(a)** Accuracy of completed drawing showing smaller flap to fit inside (0–2) [2]

(b) Requires no recess to be cut out, can be folded into flat surface [1]

10

Plane	Name	Specific use
	smoothing plane	cleaning up wood
	jack plane	preparation of wood

(4 × 1) [4]

Section B

11 (a) (i) More stable, available in wide boards, variety of finishes available, strength explained, environmentally friendly [2]

(ii) Veneer is a thin layer of solid wood (1)
Veneer is glued onto the surface of the manufactured board (1) [2]

(iii) Methods include: solid wood lipping pinned and glued, tongue and grooved, iron-on.
For maximum marks the method must be clear and notes must provide full description. [3]

(b) (i) Waste to allow for saw cut [1]

(ii) To cut the wood fibres to prevent splitting, more permanent [1]

(iii) Jig saw, circular saw, scroll, Hegner or equivalent, band saw [1]

(iv) No trailing lead, clear area below sawing, material clamped down, goggles, ear defenders. [1]

(c) Set of instructions:
Apply glue into holes of ends, insert dowel pegs, locate and join base to end, apply force using hammer and scrap wood, wipe of surplus glue.
Accept any relevant 'minor' stages that provide useful detail. (6 × 1) [6]

(d) Some form of drilling or dowel jig or template is required.
Details of process: mark out holes, drill holes, insert dowel pins, mark out corresponding holes and drill to depth.

OR
Hammer panel pins into ends, 'snip' off heads and press into ends, drill to depth.

For maximum marks, clear description of suitable process must be evident. [4]

OR
2 pieces taped together and marked out as one = 2 marks

OR
Accept any improvisation that adds to accuracy = 1 mark

(e) Some sort of bearing surface / pivot fitted into base (0–1)
remains level (0–1)

Details of materials, sizes and fittings (0–2) [4]

12 (a) (i) Hammer, centre punch, rule, try square, scriber [2]

(ii) Drill hole, insert file and file to shape (2 × 1)
work clamped down on a bench or supported in a vice (0–2) [4]

(iii) Hand file, flat file [2]

(b) Full description of sheet metal bender (0–3)
OR
Use of vice or clamp, former or folding bars,
hammer and scrap wood or mallet (0–3) [3]

(c) Sketch and notes to show suitable means of strengthening: bracing, support brackets, corner fillet (0–2)

Sketch and notes to show slots or larger holes for files (0–2) [4]

(d) (i) Angle [1]

(ii) Advantage: no bending necessary [1]

Disadvantage: more awkward to drill and file [1]

(e) Accuracy of appropriate nut and bolt, coach bolt (0–2) [2]

(f) Practical solution: additional support/ends fitted to existing rack/4 legs (0–3)

Details of materials, sizes and fittings (0–2) [5]

13 (a) (i) Wide variety of hardwoods accepted [1]

(ii) 2 attractive features: grain, figure, colour, knot free [2]

(b) Drill holes, insert saw blade and cut out waste, file up to line
Accept any 4 clearly identified stages (4 × 1) [4]
Chisel and mallet = 2 marks

(c) (i) Correct marking gauge line (1)
Correct cutting gauge line (1) [2]

(ii) Marking out not required.
Sawn across to depth (1)
Chiselled out across and down [2 methods] (0–2)
Accuracy of named tools / equipment (1)
OR
Method of holding work: vice, bench hook, G cramp (1)
Use of tenon saw (1)
Use of chisel (1)
Accuracy of named tools/equipment (1) [4]

(d) (i) Use of rubber bands or string cramps and notes, corner cramps [2]
Use of panel pins as temporary fixing
Use of vice = 1 mark

(ii) Corner to corner diagonal measurement [1]
Try square [1]

(e) Method of fitting **inside** includes: rebate, applied bead, strips, blocks, groove (1)
Accuracy of method drawn (0–2) [3]
Base fitted onto edge = 1 mark
Base fitted inside with glue /pins or screws = 1 mark

(f) Net required (1)
Cut out appropriately (1)
Method of bending: heating and former (2 × 1)
Technical accuracy (1)
OR
5 separate pieces: marked out (1)
Cut out (1)
Edges made flat (1)
'Glued' together (1)
Technical accuracy (1) [5]