



DESIGN AND TECHNOLOGY

0445/32

Paper 3 Resistant Materials

October/November 2018

MARK SCHEME

Maximum Mark: 50

Published

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 International will not enter into discussions about these mark schemes.

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This document consists of **6** printed pages.

Generic Marking Principles

These general marking principles must be applied by all examiners when marking candidate answers. They should be applied alongside the specific content of the mark scheme or generic level descriptors for a question. Each question paper and mark scheme will also comply with these marking principles.

GENERIC MARKING PRINCIPLE 1:

Marks must be awarded in line with:

- the specific content of the mark scheme or the generic level descriptors for the question
- the specific skills defined in the mark scheme or in the generic level descriptors for the question
- the standard of response required by a candidate as exemplified by the standardisation scripts.

GENERIC MARKING PRINCIPLE 2:

Marks awarded are always **whole marks** (not half marks, or other fractions).

GENERIC MARKING PRINCIPLE 3:

Marks must be awarded **positively**:

- marks are awarded for correct/valid answers, as defined in the mark scheme. However, credit is given for valid answers which go beyond the scope of the syllabus and mark scheme, referring to your Team Leader as appropriate
- marks are awarded when candidates clearly demonstrate what they know and can do
- marks are not deducted for errors
- marks are not deducted for omissions
- answers should only be judged on the quality of spelling, punctuation and grammar when these features are specifically assessed by the question as indicated by the mark scheme. The meaning, however, should be unambiguous.

GENERIC MARKING PRINCIPLE 4:

Rules must be applied consistently e.g. in situations where candidates have not followed instructions or in the application of generic level descriptors.

GENERIC MARKING PRINCIPLE 5:

Marks should be awarded using the full range of marks defined in the mark scheme for the question (however; the use of the full mark range may be limited according to the quality of the candidate responses seen).

GENERIC MARKING PRINCIPLE 6:

Marks awarded are based solely on the requirements as defined in the mark scheme. Marks should not be awarded with grade thresholds or grade descriptors in mind.

Question	Answer	Marks
1(a)	Marking gauge	1
1(b)	Jack, smoothing, block	1

Question	Answer	Marks
2	Extrusion	1

Question	Answer	Marks
3	Dividers = 1, used to mark arcs/circles [on plastic/metal] = 1 Centre/dot punch = 1, make an indentation in metal before drilling = 1	4

Question	Answer	Marks
4	2 slots drawn in A = 1, 2 slots drawn in B = 1, 2 biscuits drawn = 1	3

Question	Answer	Marks
5	A urea formaldehyde B melamine C epoxy resin 3 × 1	3

Question	Answer	Marks
6(a)	References to turning: e.g. to hold round or hexagonal shaped metal	1
6(b)	References to turning: e.g. to hold round, square or irregular shaped metal	1

Question	Answer	Marks
7(a)	Carbon fibre reinforced plastic [CFRP]	1
7(b)	Good strength-weight ratio, lightweight, corrosion resistance, stiff, rigid, good tensile strength, low density 2 × 1	2

Question	Answer	Marks
8(a)	Soft	1
8(b)	Hard or silver	1

Question	Answer	Marks
9	Screw thread shown inserted into leg [left-to-right] = 1 Barrel shown inserted into side of rail = 1 Correct positioning/distances = 1	3

Question	Answer	Marks
10(a)	Blow moulding, extrusion blow moulding	1
10(b)	To make flat bottom a flat shape should be drawn on top of bowl shape = 1	1

Question	Answer	Marks
11(a)(i)	4 bend lines drawn 4 × 1	4
11(a)(ii)	Felt marker	1
11(b)	Acrylic shown above strip heater/line bender or hot air gun or in an oven 0–2 Use of a shaped former or 2 separate blocks 0–2 Technical accuracy of details 0–1	5
11(c)	Waste removed: use of coping saw, Hegner or equivalent, Scroll, band = 1 Acrylic held appropriately: vice or clamped to bench = 1 Rounded corners: use of flat/hand and round/rat tail or half-round files = 1 Technical accuracy of details = 1	4
11(d)(i)	Draw filing	1
11(d)(ii)	Different grades means a finer grade can be used to remove the scratches produced by the previous coarser grade 2 × 1	2
11(e)(i)	Acrylic cement applied to both parts = 1 Clamped using G cramps, sash cramps, vice or weights = 1	2
11(e)(ii)	Fumes given off by acrylic cement can be harmful to user	1
11(f)	Practical idea: additional storage joined to appropriate part of holder 0–2 Details of appropriate processes 0–2 Technical accuracy of named tools and equipment 0–1	5

Question	Answer	Marks
12(a)(i)	Plywood, faced chipboard, MDF, blockboard, laminboard	1
12(a)(ii)	18–20 mm	1
12(a)(iii)	Wide variety available: ash, oak, beech, mahogany, teak	1
12(a)(iv)	anthropometrics	1

Question	Answer	Marks
12(b)(i)	Steel rule, try square, marking gauge, mortise gauge, cutting gauge, marking knife 2 × 1	2
12(b)(ii)	Tenon saw, coping saw, chisel, mallet 2 × 1	2
12(c)	Some form of added strip/blocks/brackets required Processes describing methods of construction Named adhesive 0–2 0–2 0–1	5
12(d)(i)	Sash, bar, F, speed	1
12(d)(ii)	Wide variety available: synthetic resin, PVA. Accept trade names: e.g. Evo-Stik Resin W, Cascamite, Aerolite	1
12(d)(iii)	2 checks: joint pulled together, squareness, not in winding, removal of surplus adhesive, cramps not over-tightened	2
12(e)(i)	Advantage: no need for separate fabricated constructions, quicker = 1 Disadvantage: wasteful of material = 1	2
12(e)(ii)	Jig saw, router	1
12(e)(iii)	Check overall condition of tool before use, no trailing leads, no loose clothing, work piece secure, hair tied back 2 × 1	2
12(f)	Developments in flat-pack furniture design, self-assembly KD fittings, social/technological trends; eg use of PCs.	3

Question	Answer	Marks
13(a)	Hardwood uprights: wide variety of suitable hardwoods = 1 Metal rod: mild steel, stainless steel, aluminium, brass = 1 Manufactured board: MDF, chipboard, plywood = 1	3
13(b)(i)	Benefit: gives appearance of solid wood, more attractive Drawback: more easily damaged, veneer could peel off, less hardwearing	1
13(b)(ii)	Drawback: more easily damaged, veneer could peel off, less hardwearing	1
13(c)	Template with 3 holes drilled-no location = 1 Template + 1 side located = 2 Template + 2 sides located = 3 Template + 2 sides + end located = 4 Specific named material/s appropriate = 1	5
13(d)	Use of vice to support the metal rod = 1 Method of force: hammer and scrap wood or mallet = 1 Check correct angle of lower bend with former = 1 90° angle checked against vice jaw/wooden former = 1	4
13(e)	Stages include: degrease metal if necessary. Use steel wool [fine grade] or wet and dry [silicon carbide] paper [2 grades]. Use of polishing mop and appropriate compound to produce quality finish.	3

Question	Answer	Marks
13(f)(i)	Marking and cutting gauges, marking knife, try square	1
13(f)(ii)	Tenon saw, dovetail [tenon] saw	1
13(g)	Threaded rod = 1 Nut screws onto threaded rod = 1 Nut inset into shelf to become hidden = 1 Technical accuracy of method 0–1	4
13(h)	Adjustable height of shelves, good use of relatively few materials, simple design, straightforward to manufacture, easy to adjust height, easy to maintain/clean 2 × 1	2