CAMBRIDGE
International Education

Cambridge IGCSE™

DESIGN AND TECHNOLOGY **0445/33**

Paper 3 Resistant Materials **May/June 2025**

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.

Cambridge International is publishing the mark schemes for the May/June 2025 series for most Cambridge IGCSE, Cambridge International A and AS Level components, and some Cambridge O Level components.

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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 descriptions 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.

Annotations guidance for centres

Examiners use a system of annotations as a shorthand for communicating their marking decisions to one another. Examiners are trained during the standardisation process on how and when to use annotations. The purpose of annotations is to inform the standardisation and monitoring processes and guide the supervising examiners when they are checking the work of examiners within their team. The meaning of annotations and how they are used is specific to each component and is understood by all examiners who mark the component.

We publish annotations in our mark schemes to help centres understand the annotations they may see on copies of scripts. Note that there may not be a direct correlation between the number of annotations on a script and the mark awarded. Similarly, the use of an annotation may not be an indication of the quality of the response.

The annotations listed below were available to examiners marking this component in this series.

Annotations

Annotation	Meaning
	Unclear
	Benefit of the doubt
	Incorrect point
	Error carried forward
N/A	Highlighting areas of text
	No benefit of doubt given
N/A	Off-page comment – allows comments to be entered off the page
	Repeat
	Indicates that the point has been noted, but no credit has been given
	Indicates that the point has been noted, but no credit has been given (big)

Annotation	Meaning
	Correct point
TV	Too vague
DET	Relevant detail

Question	Answer	Marks	Guidance
1	Trees contain moisture, timber needs to be dried, reduce moisture content, prevent shrinkage, warping and rotting [2 × 1]	**2**	

Question	Answer	Marks	Guidance
2a	Extrusion	**1**	
2b	Injection moulding, vacuum forming, press forming	**1**	

Question	Answer	Marks	Guidance
3(a)	Sash cramp	**1**	
3(b)	Reasons: to protect the hardwood from 'bruising', to distribute pressure [2 × 1]	**2**	

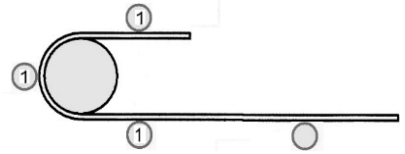
Question	Answer	Marks	Guidance
4	**A** scriber **B** centre square, centre finder [2 × 1]	**2**	

Question	Answer	Marks	Guidance
5(a)	Former must 'match' shape of bends [1] Accuracy and proportion [1]	**2**	
5(b)	Strip heater/line bender heats specific area. Oven heats whole sheet.	**1**	

Question	Answer	Marks	Guidance
6	Polymorph is immersed in hot water, Material becomes soft and is moulded by hand [2 × 1]	**2**	Do not reward 'moulded by hand' on its own

Question	Answer	Marks	Guidance
7	Award 1 mark for each 'halving' shown [2 × 1] Technical accuracy/proportion [1]	**3**	

Question	Answer	Marks	Guidance
8	Suitable hinge: piano [1] Accuracy: award any **two** from: 2 leaves, drilled holes, length [2 × 1]	**3**	

Question	Answer	Marks	Guidance
9	 [3 × 1]	3	

Question	Answer	Marks	Guidance
10	Chair **A** castors move, armrests, adjustable & padded seat and back [1] Chair **B** lightweight tube construction, minimal use of materials, fewer parts to replace, folds up [1]	2	Accept any valid features

Question	Answer	Marks	Guidance
11(a)	2 Specification points include: must not interfere with operation of machine, must be secure on pillar of machine, hold different types of drill, allow for easy access, easy to adjust [2 × 1]	2	Accept any valid spec. points
11(b)(i)	Number of separate plies shown (minimum 3) [1] Grain shown in opposite directions on plies [1]	2	
11(b)(ii)	Explanation: grain structure cancels out movement making board stable [0 – 2]	2	
11(c)(i)	Hole saw, hole cutter, tank cutter, Forstner bit, saw tooth bit	1	
11(c)(ii)	Mortising machine, router	1	

Question	Answer	Marks	Guidance
11(c)(iii)	Saw off waste [1] Edges filed smooth [1] 'Sand' edges [1] Accuracy of named tools and equipment [1]	**4**	Coping, Hegner, scroll, band saws. jig saw Hand, flat, half round files Glasspaper, sandpaper, bobbin sander, disk sander
11(d)	Depth stop can be set to 12 mm on portable, bench or pedestal drills Collars can be fitted to twist drill bits set to 12 mm	**2**	Accept references to milling machine setting Use of tape or equivalent wrapped around drill
11(e)(i)	Allen key, hex key, hexagonal head screwdriver	**1**	
11(e)(ii)	Screw shown through collar and rack [2 × 1] Barrel nut shown in side or top of rack [1] Quality of sketches and notes [1]	**4**	
11(f)	Suitable materials named [1] Constructions used to make the container [0 – 2] Some sort of 'lid' to keep glasses clean [1] Method of fixing to wall [0 – 2]	**6**	Fixing to wall: 2 screw holes inside box = 1, slot screws = 2 2 screw holes in 'backboard' (extends beyond box) = 2 Do not accept use of magnets

Question	Answer	Marks	Guidance
12(a)	Thin layer of solid wood, cut from logs, used to cover manufactured boards to make attractive [2 × 1]	**2**	Accept references to uses for veneer
12(b)	Veneers glued together [1] Use of male and female formers [2 × 1] Veneers clamped around former [1]	**4**	Accept references to 'vacuum bag'
12(c)(i)	Scriber, felt tip pen	**1**	

Question	Answer	Marks	Guidance
12(c)(ii)	Odd-leg calipers	**1**	
12(c)(iii)	Centre or dot punch	**1**	
12(c)(iv)	Hacksaw, junior hacksaw	**1**	
12(c)(v)	Hand, flat or half round file	**1**	
12(d)(i)	2 abrasives: emery cloth, wet and dry (silicon carbide paper), aluminium oxide paper, steel/wire wool [2 × 1]	**2**	
12(d)(ii)	2 advantages: more even finish, no brush strokes, quicker [2 × 1]	**2**	
12(d)(iii)	2 safety precautions: well-ventilated area, no naked flames, goggles, mask to prevent inhalation of fumes, face mask, gloves [2 × 1]	**2**	Accept mask and goggles as 2 different answers
12(e)	Length of 25 mm marked or cut on jig [1] Dowel held securely while sawn [1] Quality of sketches and notes [1]	**3**	
12(f)	Modification example: Hole in one end of stand with support underneath, some sort of hook or bracket attached to stand Safe and secure storage of ‘beater’ [1] Sizes, materials and constructions used [reward any **2** from **3]** [0 – 2]	**3**	

Question	Answer	Marks	Guidance
12(g)	Beech is more sustainable than mild steel [1] Beech trees can be replaced when felled **OR** Mild steel comes from a finite source [1]	**2**	

Question	Answer	Marks	Guidance
13(a)	Properties include: attractive, variety of colours, self-finishing, easily shaped, easy to work, easy to clean, lightweight to carry, durable [2 × 1]	**2**	
13(b)(i)	Hegner, band, scroll saw	**1**	Do not accept jig saw
13(b)(ii)	Hand, flat or half round file	**1**	
13(b)(iii)	Wet and dry (silicon carbide paper)	**1**	
13(b)(iv)	Position **C**	**1**	
13(c)(i)	2 benefits: ease and speed of editing, data can be transferred to a CNC machine, view from all angles, 3D views, accurate measurements, drawings can be sent electronically [2 × 1]	**2**	Accept any valid benefit
13(c)(ii)	2 advantages: speed, accuracy, repetitive accuracy, no edge finishing reqd. time efficient, less waste of materials [2 × 1]	**2**	Accept any valid advantage

Question	Answer	Marks	Guidance
13(d)	Male former shown [1] Female former shown [1] Acrylic heated in an oven [1] Acrylic clamped between formers [1]	**4**	
13(e)	Does it make the stand more stable [0 – 2] Named materials appropriate [1] Constructional details [1]	**4**	Modifications added to the top of the stand = 1
13(f)	Practical modification: some sort of ‘hook’ or ‘bracket’ for cable to wrap around [0 – 2] Position for device on **back** or **base** [1] Constructional details [1]	**4**	
13(g)	Explanation can include: not all plastics can be recycled, discarded plastic products litter the planet, plastic takes a long time to decompose, polluting the land and oceans, negative effects on wildlife, overflowing landfill The manufacture of plastics can give off harmful gases into the atmosphere	**3**	Accept any valid points. Reward several points made or one or two expanded points.