CAMBRIDGE
International Education

Cambridge IGCSE™

DESIGN & TECHNOLOGY **0445/32**

Paper 3 Resistant Materials **October/November 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 October/November 2025 series for most Cambridge IGCSE, Cambridge International A and AS Level components, and some Cambridge O Level components.

PUBLISHED

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 standard isation 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	2 reasons: board not stacked level, uneven seasoning, excess moisture removed too quickly, exposed to sun/heat, change in temperature, improper storage during seasoning [2 × 1]	**2**	Accept any valid reason referencing removal of moisture **Do not accept** references to 'weight placed on board', or added moisture

Question	Answer	Marks	Guidance
2(a)	Stainless steel, cast iron	**1**	**Do not accept** iron, steel, mild steel
2(b)	Phenol formaldehyde (PF) phenolic resin, Bakelite, melamine formaldehyde (MF)	**1**	

Question	Answer	Marks	Guidance
3	(Laying up) glass fibre	**1**	

Question	Answer	Marks	Guidance
4	1 board shown with ½ lap [1] 1 board shown 'unchanged' [1] Technical accuracy, proportion [1]	**3**	Award 1 mark for 'double lapped joint

Question	Answer	Marks	Guidance
5(a)	Diecasting	**1**	
5(b)	Injection moulding, 3D printing	**1**	

Question	Answer	Marks	Guidance
6(a)	Outside / external calipers	**1**	**Do not accept** 'caliper'
6(b)	Sketch shows 'tip' of caliper [1] positioned against end of steel rule [1]	**2**	Award 1 mark for 'tips' of caliper shown **along** the rule but not at the end

Question	Answer	Marks	Guidance
7	2 checks: surface check for marks/blemishes, rough surfaces/edges, 'bubbles', dimensional checks, do the two parts fit and separate, do the buttons line up with the holes [2 × 1]	**2**	Accept references to 2 dimensional checks Accept any valid checks

Question	Answer	Marks	Guidance
8	Sheet steel shown secured in vice or clamped [1] Use of former for steel to be bent around [1] Method of force: use of hammer and scrap wood or mallet [1]	**3**	**Do not accept** use of heat, or references to marking out

Question	Answer	Marks	Guidance
9	Examples of ergonomic features: shaped handle [1] is comfortable to grip [1] curved shape [1] is comfortable to carry [1] lightweight design [1] makes it comfortable to carry [1] cranked handle [1] makes it easier to turn [1]	**4**	Does the answer demonstrate an understanding of 'ergonomics'?

Question	Answer	Marks	Guidance
10	Use of bench stop or clamped wood equivalent shown clearly [0 – 2] **OR** Use of pins/nails to secure wood to bench [0 – 2] Added explanatory notes [1]	**3**	Accept double-sided tape: Award 1 mark if stated only Award 2 marks if tape is shown on base of wood

Question	Answer	Marks	Guidance
11(a)	2 reasons include: hard, tough, durable, resists splits and splintering, close-grained, finishes well, attractive [2 × 1]	**2**	**Do not accept** easy to work, lightweight, strong, cheap
11(b)	Name of suitable joint: mortise and tenon, dowel, biscuit [1] Tenon shown with 'shoulders' [2] Quality of communication [1]	**4**	Accept 'mortise' Complete width of 'support' shown in mortise 1 **Do not accept** nails or screws through base into 'support' Dowels: min. 2 – max. 4 Biscuits: min. 2 – max. 3
11(c)(i)	Circular saw, table saw, band saw, scroll saw, Hegner saw, jig saw	**1**	
11(c)(ii)	Fingers behind surfaces being sanded, face mask, safety glasses, goggles, glasses, respirator, hair tied back, no loose clothing, no spectators, hold the workpiece securely	**1**	**Do not accept** gloves, apron
11(c)(iii)	Hardwood shown angled so that sawn edge **B** could be horizontal when planed	**1**	
11(c)(iv)	Smoothing plane, jack plane, block plane	**1**	
11(d)(i)	Contact adhesive bonds immediately, no need for clamping, PVA takes 2–3 hours to set	**1**	**Do not accept** stronger

Question	Answer	Marks	Guidance
11(d)(ii)	Well-ventilated area, no naked flames, mask to prevent fume inhalation, wear gloves	**1**	**Do not accept** goggles
11(d)(iii)	Sketch showing fitting through arrow, arm and upright [1] Dowel, 'pin', rod, screw thread must pass through arm and support [1] Must be retained at front **and** back [1]	**3**	
11(e)(i)	Forstner, saw tooth bit	**1**	
11(e)(ii)	Depth stop can be set to 15 mm on portable, bench or pedestal drills **OR** Lower bench drill table to allow 15 mm depth	**2**	Award 1 mark for: Adhesive tape can be fitted to drill bits set to 15 mm **OR** mark made on drill bit
11(f)(i)	Draft angle enables the plastic pan to be released **more easily** from the mould	**2**	Award 1 mark for reference to removal from mould without **more easily** stated
11(f)(ii)	Correct positions: mould, heater and plastic sheet [3 × 1]	**3**	
11(g)	Variety of methods include: use of hook and eye, 'notches' cut out of arm [0 – 2]	**2**	Accept any valid method Award 0 – 2 dependent on technical accuracy of practical idea

Question	Answer	Marks	Guidance
12(a)	2 items: dimensions of controller, headset, weight of controller, headset, size of controller, headset, best areas to be supported, method of secure support, location, research existing products [2 × 1]	**2**	Accept any valid items of research
12(b)	2 advantages: smoother surfaces, 'consistent' structure, no grain, easier to work, cheaper [2 × 1]	**2**	Accept any valid advantages **Do not accept** lightweight, stronger
12(c)(i)	Benefit: speed, [repetitive] accuracy	**1**	Accept any valid benefits
12(c)(ii)	Thin metal sheet will withstand 'wear and tear' better than card, durable	**1**	Accept any valid advantage
12(c)(iii)	2 saws: coping, jig, Hegner, scroll, band saws, tenon, dovetail [2 × 1]	**2**	Accept combination of any **two** saws
12(d)	Upright and supports joined to base **with** shoulders [2] **OR** Upright and supports joined to base **without** shoulders [1] Technical accuracy of sketches/Quality of communication [1]	**3**	**No name of joint required**
12(e)	Suitable adhesive: PVA [accept wide range available] [1] Clamping: G cramps or vice [1], use of scrap wood [1] accurately drawn [1] Checks: wipe off surplus glue, check tightness of cramps, check alignment [2 × 1]	**6**	Internet search for uncommon names Clamping: accept 'F' cramp and 'sash' cramps
12(f)(i)	More even pressure, more effective use of glasspaper, quicker, smoother	**1**	**Do not accept** better grip, easier to sand

Question	Answer	Marks	Guidance
12(f)(ii)	Descriptions include: primer coat seals the surface of the wood, provides better adhesion for subsequent coats of paint, prevents wood from absorbing the final paint, prepares the surface/to take the final coat	**2**	Accept **ONE** detailed description of one point or two separate descriptions
12(f)(iii)	Advantages: more even finish, no brush strokes, quicker, better appearance	**1**	
12(f)(iv)	Safety precaution: face mask, mask, ventilation	**1**	Accept any valid precaution **Do not accept** goggles, safety glasses, gloves
12(g)	**Checking the product**: check position of controller on holder, is it stable and secure in position, does the headset fit? check against original specification **Use of questionnaire/survey** with potential users, collate results data [0 – 3]	**3**	Award 0–3 dependent on quality of response

Question	Answer	Marks	Guidance
13(a)	2 benefits: cheap, cheaper than solid wood, more stable, more readily available [2 × 1]	**2**	**Do not accept** durable, lightweight, aesthetically pleasing
13(b)	Mild steel tube held securely [1] Jig allows tube to be cut without measuring/marking out [1] Suitable material for jig named [1] Saw used: hacksaw, junior hacksaw [1]	**4**	
13(c)(i)	2 abrasives: emery cloth, wet and dry [silicon carbide] paper, steel wool [2 × 1]	**2**	
13(c)(ii)	Flux prevents oxidisation [keeps the metal clean] [1] Allows the brazing rod to flow [1]	**2**	
13(c)(iii)	Recognisable ‘plug’, ‘cap’ or ‘cover’ [1] Named material [1] Technical accuracy & quality of communication [1]	**3**	
13(d)(i)	Scriber, steel rule, [engineer’s] try square, centre punch, dot punch [2 × 1]	**2**	
13(d)(ii)	Mild steel secure in vice, folding bar, clamped to bench [1] Some sort of former/shape to bend around [1] Method of force: hammer and scrap wood or mallet Accuracy of named tools and equipment [1]	**4**	**Do not accept** use of heat Award 1 mark for **at least 2 tools or equipment** are named correctly
13(d)(iii)	Annealing	**1**	

Question	Answer	Marks	Guidance
13(e)	Method: some sort of 'hook' joined to the shelf and onto **or** around the Ø10 tube. Method: rod or dowel fitted into end of shelf and resting on Ø10 tube Practical method [0 – 2] Suitable named material [1] Constructions [1] **One** important size [1]	**5**	Accept any practical design idea that shows connection between shelf and Ø10 tube Size not already given