



## Cambridge IGCSE™

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DESIGN AND TECHNOLOGY

0445/32

Paper 3 Resistant Materials

May/June 2020

MARK SCHEME

Maximum Mark: 50

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**Published**

Students did not sit exam papers in the June 2020 series due to the Covid-19 global pandemic.

This mark scheme is published to support teachers and students and should be read together with the question paper. It shows the requirements of the exam. The answer column of the mark scheme shows the proposed basis on which Examiners would award marks for this exam. Where appropriate, this column also provides the most likely acceptable alternative responses expected from students. Examiners usually review the mark scheme after they have seen student responses and update the mark scheme if appropriate. In the June series, Examiners were unable to consider the acceptability of alternative responses, as there were no student responses to consider.

Mark schemes should usually be read together with the Principal Examiner Report for Teachers. However, because students did not sit exam papers, there is no Principal Examiner Report for Teachers for the June 2020 series.

Cambridge International will not enter into discussions about these mark schemes.

Cambridge International is publishing the mark schemes for the June 2020 series for most Cambridge IGCSE™ and Cambridge International A & AS Level components, and some Cambridge O Level components.

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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	Dividers Centre / dot punch Odd legs/ odd leg calipers/ Jenny[s] calipers.	1 1 1 <b>3</b>

Question	Answer	Marks
2	Dovetail, finger [comb], dowel, lapped, half-lapped Suitable joint recognised Correct orientation [as per Fig. 2.1] Good proportion/accuracy	1 1 1 <b>3</b>

Question	Answer	Marks
3	Beech Stainless steel, mild steel, aluminium, brass Melamine	1 1 1 <b>3</b>

Question	Answer	Marks
4	Marking out Cutting to length Method of joining	1 1 1 <b>3</b>

Question	Answer	Marks
5	Method of locating end against underside of table Method of fixing must be removeable	1 1 <b>2</b>

Question	Answer	Marks
6	3 points include: comfortable to hold, easy to operate/open can, safe to use, easy to clean, durable materials, strong constructions	3 × 1 <b>3</b>

Question	Answer	Marks
7	2 main processes: drill hole file to shape	1 1 <b>2</b>

Question	Answer	Marks
8(a)	Tough, durable, attractive, resists corrosion, evenly applied	1 <b>1</b>
8(b)	When cut/chipped can be difficult to repair	<b>1</b>

Question	Answer	Marks
9	Thermochromic	1

Question	Answer	Marks
10	Use of pegs, dowels Ease of fitting Attractive/practical for product	1 1 1
		3

Question	Answer	Marks
11(a)	Male former Female former Veneers glued together Clamping method	1 1 1 1
		4
11(b)	Modification should retain the keys: use of grooves or 'stopped' end	0–2
		2
11(c)	Additional plate/bracket added to front and back Method of pivoting, e.g. use of pin or peg Named materials	2 × 1 1 1
		4
11(d)(i)	Teak oil, Danish oil, white/French polish, lacquer, wax	2 × 1
		2
11(d)(ii)	2 stages: glasspaper, damp cloth to wipe off dust, different grades of glasspaper	2 × 1
		2
11(e)(i)	Use of oven to soften acrylic Use of a former Method of retention	1 1 1
		3
11(e)(ii)	Acrylic [Tensol] cement named Method of application	1 1
		2
11(e)(iii)	Award any 3: use of scraper, wet and dry [silicon carbide] paper, 2 different grades, polishing mop/ buffing wheel polishing compound	3 × 1
		3
11(f)	Explanation: Timber can be 'managed' and trees replanted, low carbon footprint, wood decomposes Plastic is a finite resource	
		3

Question	Answer	Marks
12(a)	Sketches to show: tube held in vice hacksaw to cut tube use of files to make edges flat correctly named tools and equipment	1 1 1 1
		4

Question	Answer	Marks	
12(b)	emery cloth used to clean joint tube positioned on firebricks, set up to produce max. heat flux used to prevent oxidation and allow spelter to flow blow torch used to heat up tube to reqd. temperature brazing rod heated and melted into joint	1 1 1 1 1	<b>5</b>
12(c)	Steel 'plate' inserted into end of tube or additional nut Hole drilled and threaded in 'plate'	1 1	<b>2</b>
12(d)	Square handle made comfortable: Accept any practical modification Details of materials	1 1	<b>2</b>
12(e)	Former shows draft angle/'sloping' sides Rounded edges to match tray shape	1 1	<b>2</b>
12(f)	2 benefits: fast process, reusable former, repetitive accuracy	2 × 1	<b>2</b>
12(g)	Method of support: extra 'rails' and/or modified 'lipping' shape Ease of removal Appropriate materials and constructions used	0–2 1 1	<b>4</b>
12(h)	Metal: product could be disassembled, reused and/or recycled Plastic: is a finite/unsustainable material, difficult to recycle	0–2 0–2	<b>4</b>

Question	Answer	Marks	
13(a)(i)	Suitable manufactured board: plywood, chipboard, blockboard, MDF.		<b>1</b>
13(a)(ii)	Reasons for manufactured board: stable, does not shrink, available in wide boards.	2 × 1	<b>2</b>
13(b)	700 long dependent upon the items for which the table is intended 400 high dependent upon anthropometrics, existing furniture	1 1	<b>2</b>
13(c)(i)	Smoothing, jack		<b>1</b>
13(c)(ii)	Leg shown in vice Angled slightly <b>OR</b> Use of bench stop Leg shown clearly against bench stop	1 1 1 1	<b>2</b>
13(d)(i)	Quicker than by hand, even finish possible, removal of stubborn marks easier	2 × 1	<b>2</b>
13(d)(ii)	Portable tool safety: no trailing leads, clear area below tool, set up of tool correctly before use, electrical safety in use [e.g. unplugging when changing blades etc.]	2 × 1	<b>2</b>

Question	Answer	Marks
13(d)(iii)	2 benefits: tough, heat, stain and water resistant, attractive	2 × 1 <b>2</b>
13(e)(i)	Accurate drawing of hinge Correct position	0–2 1 <b>3</b>
13(e)(ii)	Suitable hinge: butt, back flap, flush named	1 <b>1</b>
13(e)(iii)	Suitable material: steel or brass	1 <b>1</b>
13(f)	'Locking' method: some form of 'stay', rods and holes. Appropriate materials Details of fittings used	0–3 1 0–2 <b>6</b>