



Coimisiún na Scrúduithe Stáit
State Examinations Commission

Junior Certificate 2013

Marking Scheme

Materials Technology Wood

Higher Level

Note to teachers and students on the use of published marking schemes

Marking schemes published by the State Examinations Commission are not intended to be standalone documents. They are an essential resource for examiners who receive training in the correct interpretation and application of the scheme. This training involves, among other things, marking samples of student work and discussing the marks awarded, so as to clarify the correct application of the scheme. The work of examiners is subsequently monitored by Advising Examiners to ensure consistent and accurate application of the marking scheme. This process is overseen by the Chief Examiner, usually assisted by a Chief Advising Examiner. The Chief Examiner is the final authority regarding whether or not the marking scheme has been correctly applied to any piece of candidate work.

Marking schemes are working documents. While a draft marking scheme is prepared in advance of the examination, the scheme is not finalised until examiners have applied it to candidates' work and the feedback from all examiners has been collated and considered in light of the full range of responses of candidates, the overall level of difficulty of the examination and the need to maintain consistency in standards from year to year. This published document contains the finalised scheme, as it was applied to all candidates' work.






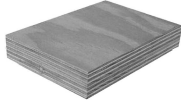







In the case of marking schemes that include model solutions or answers, it should be noted that these are not intended to be exhaustive. Variations and alternatives may also be acceptable. Examiners must consider all answers on their merits, and will have consulted with their Advising Examiners when in doubt.

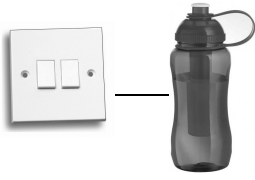


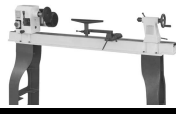



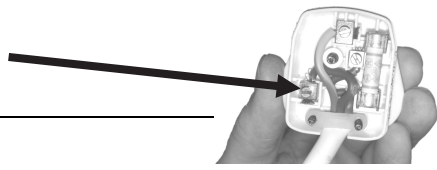
Future Marking Schemes

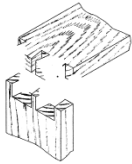

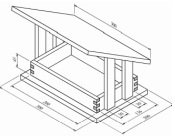
Assumptions about future marking schemes on the basis of past schemes should be avoided. While the underlying assessment principles remain the same, the details of the marking of a particular type of question may change in the context of the contribution of that question to the overall examination in a given year. The Chief Examiner in any given year has the responsibility to determine how best to ensure the fair and accurate assessment of candidates' work and to ensure consistency in the standard of the assessment from year to year. Accordingly, aspects of the structure, detail and application of the marking scheme for a particular examination are subject to change from one year to the next without notice.

SECTION A

Mark for best 16 answers. Disallow marks for any questions/parts of questions in excess of 16 as per instructions to Assistant Examiners

QUESTION	ANSWER	MARKS																		
1.	(i) Correct name for the tool... <p style="text-align: center;"><i>Router</i></p>	 3 marks																		
	(ii) Specific use of router... <p style="text-align: center;"><i>Routing/Cutting mouldings, joints, grooves, rebates, carvings...</i></p>	 2 marks																		
2.	(i) Name of Tool... <p style="text-align: center;"><i>Pincers</i></p>	 3 marks																		
	(ii) Function... <p style="text-align: center;"><i>Removing nails from wood, cutting wire.</i></p>	 2 marks																		
3.	Identify trees... <table border="1" style="margin-left: auto; margin-right: auto; border-collapse: collapse; text-align: center;"> <thead> <tr style="background-color: black; color: white;"> <th style="padding: 5px;">Softwood</th> <th style="padding: 5px;">Trees</th> <th style="padding: 5px;">Hardwood</th> </tr> </thead> <tbody> <tr> <td style="padding: 5px;"></td> <td style="padding: 5px;">Ash</td> <td style="padding: 5px;">✓</td> </tr> <tr> <td style="padding: 5px;">✓</td> <td style="padding: 5px;">Norway Spruce</td> <td style="padding: 5px;"></td> </tr> <tr> <td style="padding: 5px;"></td> <td style="padding: 5px;">Sycamore</td> <td style="padding: 5px;">✓</td> </tr> <tr> <td style="padding: 5px;"></td> <td style="padding: 5px;">Cherry</td> <td style="padding: 5px;">✓</td> </tr> <tr> <td style="padding: 5px;">✓</td> <td style="padding: 5px;">Scots Pine</td> <td style="padding: 5px;"></td> </tr> </tbody> </table>	Softwood	Trees	Hardwood		Ash	✓	✓	Norway Spruce			Sycamore	✓		Cherry	✓	✓	Scots Pine		 5 x 1 mark
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	Ash	✓																		
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4.	Plywood... <p style="text-align: center;"><i>Weather/Water, Boil, Proof</i></p>	 2x2 marks 1x1 mark																		
5.	Life cycle... <p style="text-align: center;"><i>2.Larva 3.Pupa 4.Adult</i></p>	 2x2 marks 1x1 mark																		
6.	(i) Bevel Gears... <p style="text-align: center;"><i>Anti-Clockwise</i></p>	 3 marks																		
	(ii) Speed... <p style="text-align: center;"><i>17.5 rpm</i></p>	 2 marks																		
7.	(i) Cross section... <p style="text-align: center;"><i>Area A = Sapwood</i> <i>Area B = Heartwood</i></p>	 3 marks 2 marks																		
8.	Tree identification... <div style="display: flex; justify-content: space-around; align-items: center; text-align: center;"> <div style="margin: 10px;">  Oak </div> <div style="margin: 10px;">  Scots Pine </div> <div style="margin: 10px;">  Horse Chestnut </div> </div>	2x2 marks 1 mark																		

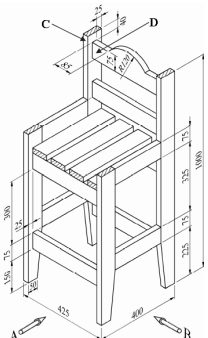
9.	(i)	Plastics... <i>Category 1 Thermoplastics</i> <i>Category 2 Thermosetting</i>		1 x 2 marks 1 x 1 mark
	(ii)	Remouldable... <i>Thermoplastic</i>		2 marks
10.	(i)	Holding device... <i>T Bar /Sash Cramp/Clamp</i> <i>Cramp/Clamp</i>		3 marks 1 mark
	(ii)	Use.. <i>Holding timber (while glue sets during assembly)</i>		2 marks
11.		Sharpening... <i>1. Grinding 2. Oil honing 3. Burr Removal</i>		2x2 marks 1x1 mark
12.	(i)	Metals... <i>Category 1 = Ferrous</i> <i>Category 2 = Non Ferrous</i>		1 x 2 marks 1 x 1 mark
	(ii)	Difference... <i>Contains iron, rusts, magnetic.</i>		2 marks
13.		Lathe parts... <i>A= Motor/Headstock/Faceplate/Screw Chuck</i> <i>B= Toolrest</i> <i>C= Tailstock/Dead/Live/Hollow centre</i>		2x2 marks 1x1 mark
14.		Machine tool... <i>Scroll/Fret Saw</i>		3 marks
		Function... <i>To keep workpiece clear of sawdust</i>		2 marks
15.	(i)	Name of feature... <i>Waney Edge</i>		3 marks
	(ii)	Conversion method... <i>Through and Through (Slash),</i> <i>Radial (Quarter), Tangential</i>		2 marks
16.		Hinge... <i>Butt Hinge</i>		3 marks
		Use... <i>Doors, box lids, cabinets.</i>		2 marks
17.		Wiring terminals... <i>Neutral</i>		3 marks
		Colour Coding... <i>Blue</i>		2 marks


18.	(i) Box Dovetail... <i>Dovetails</i> <i>Pins</i>	 3 marks 2 marks																																			
19.	(i) Fungus... <i>Serpula/Merulius lacrymans.....</i>	 2 marks																																			
	(ii) <i>Stagnant Air/Poor ventilation, Spores, Moisture, Food, Warmth.</i>	3x1 mark																																			
20.	Cutting list... <table border="1" data-bbox="341 748 1227 1155"> <thead> <tr> <th>Description</th> <th>Quantity</th> <th>Length</th> <th>Width</th> <th>Thickness</th> </tr> </thead> <tbody> <tr> <td>Base</td> <td>1</td> <td>300</td> <td>200</td> <td>12</td> </tr> <tr> <td>Long Horizontal Rail</td> <td>2</td> <td>260</td> <td>45</td> <td>12</td> </tr> <tr> <td>Short Horizontal Rail</td> <td>2</td> <td>160</td> <td>45</td> <td>12</td> </tr> <tr> <td>Long Upright</td> <td>2</td> <td>180</td> <td>30</td> <td>12</td> </tr> <tr> <td>Short Upright</td> <td>2</td> <td>150</td> <td>30</td> <td>12</td> </tr> <tr> <td>Roof</td> <td>1</td> <td>300</td> <td>240</td> <td>12</td> </tr> </tbody> </table>	Description	Quantity	Length	Width	Thickness	Base	1	300	200	12	Long Horizontal Rail	2	260	45	12	Short Horizontal Rail	2	160	45	12	Long Upright	2	180	30	12	Short Upright	2	150	30	12	Roof	1	300	240	12	 5 x 1 mark
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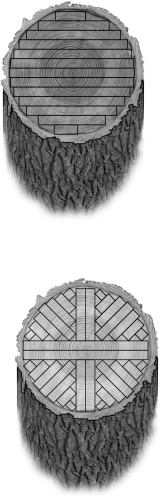

Running total of allowed questions for this section to be recorded and shown as indicated at the marking conference.

SECTION B

Mark for best 3 answers. Check all stationery and indicate running total and disallowed marks as indicated at the marking conference.

QUESTION	ANSWER	MARKS
<p>1. (i)</p>	<p>Preparation of working drawing ...</p> <p>Elevation -</p> <p><i>Setting out overall height (1000)</i> <i>Showing overall width (425)</i> <i>Showing thickness of legs (25)</i> <i>Showing position and width of any two rails (75)</i> <i>Showing, position, width and thickness of any two slats (75x25)</i> <i>Finding centre for curve</i> <i>Drawing curve</i></p> <p>End Elevation -</p> <p><i>Setting out/transferring overall height</i> <i>Setting out width (400)</i> <i>Showing width of legs (75)</i> <i>Showing position and width of rails (75)</i> <i>Showing bottom line of seat</i> <i>Showing taper on legs</i></p> <p>General -</p> <p><i>Hidden detail</i> <i>Scale</i> <i>Dimensions (any 4)</i> <i>Draughtsmanship, presentation...</i></p>  <p>NOTE:</p> <ol style="list-style-type: none"> 1. If isometric drawing presented, mark as per scheme and divide by 2 at end. 2. If the wrong scale is used, no marks for height or width in elevation and loss of scale mark. 3. If sketched, mark as per instructions at conference. 	<p>1 mark 1 mark 2 x 1 mark 2 x 2 marks 2 x 1 mark 3 marks 2 mark</p> <p>15</p> <p>1 mark 1 mark 2 x 1 mark 2 x 2 mark 1 mark 2 x 1 mark</p> <p>11</p> <p>3 marks 1 mark 1 mark 2 marks</p> <p>7</p>
<p>(ii)</p>	<p>Method of jointing C to D...</p> <p><i>Mortice and Tenon</i> <i>Dowelled joint</i> <i>Biscuit joint</i> <i>Concealed Screws/Pocket Screwed</i> <i>Domino</i></p> <p><i>Description/name only</i></p>	<p>5 + 2 marks</p> <p>2 marks</p> <p>7</p>

QUESTION	ANSWER	MARKS	
<p>2. (i)</p> 	<p>Explanation of steps in design process...</p> <p>Analysis of Brief -</p> <p><i>Examining the given brief to identify the stated requirements. Listing the problems to be overcome in order to create the project. Explaining keywords contained in the brief.</i></p> <p>Evaluation-</p> <p><i>A review of the process of designing and making the artefact where fitness for purpose, appearance, use of materials, modifications, time management, safety and stability are considered.</i></p>	<p>5 marks</p> <p>5 marks</p>	<p>10</p>
	<p>(ii) Design solution for wooden display unit...</p> <p><i>Basic unit/box without any design features. (sketch only)</i></p> <p><i>Fair attempt to store items in an attractive, suitable, free standing unit. (Must include notes)</i></p> <p><i>Good, well balanced, well sketched design, showing some innovation and creativity. (Must be in 3D and include notes)</i></p> <p><i>A quality 3D sketch of an original innovative and creative design. The sketch must be rendered or shaded and include relevant notes.</i></p>	<p>6 marks</p> <p>9 marks</p> <p>12 marks</p> <p>16 marks</p>	<p>16</p>
	<p>(iii) Description of joint...</p> <p><i>Joint name/Description and sketch</i></p>	<p>2 + 6 marks</p>	<p>8</p>
	<p>(iv) Suitable wood...</p> <p><i>Mark for any suitable named wood (including manufactured boards)</i></p> <p>Reasons ...</p> <p><i>Reasons appropriate to selected material: Cost, appearance, workability, durability, takes finishes well, easy to work with, renewable, environmentally friendly...</i></p>	<p>2 marks</p> <p>2 x 2 marks</p>	<p>6</p>


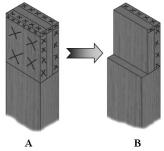
QUESTION	ANSWER	MARKS												
<p>3. (i)</p> 	<p>Methods of conversion shown in the diagrams...</p> <p><i>A- Through and through or Slash sawing</i> <i>B- Quarter or Radial sawing</i></p> <p>Advantages/Disadvantages of conversion methods ...</p> <table border="1" data-bbox="464 427 1254 943"> <thead> <tr> <th></th> <th>ADVANTAGES</th> <th>DISADVANTAGES</th> </tr> </thead> <tbody> <tr> <td>SLASH SAWING</td> <td><i>Fast, easy to set up and manipulate.</i> <i>Very little waste produced</i> <i>Wide boards</i> <i>Cheaper</i></td> <td><i>Boards prone to cupping</i> <i>Lot of sapwood in outer boards, prone to fungal and insect attack</i></td> </tr> <tr> <td>QUARTER SAWING</td> <td><i>Stable boards produced, all have ring lengths approx. equal</i> <i>Hardwearing board surface</i> <i>Silver grain effect</i></td> <td><i>More manipulation and handling of the log required</i> <i>More waste produced</i> <i>Smaller boards</i> <i>More expensive</i></td> </tr> </tbody> </table>		ADVANTAGES	DISADVANTAGES	SLASH SAWING	<i>Fast, easy to set up and manipulate.</i> <i>Very little waste produced</i> <i>Wide boards</i> <i>Cheaper</i>	<i>Boards prone to cupping</i> <i>Lot of sapwood in outer boards, prone to fungal and insect attack</i>	QUARTER SAWING	<i>Stable boards produced, all have ring lengths approx. equal</i> <i>Hardwearing board surface</i> <i>Silver grain effect</i>	<i>More manipulation and handling of the log required</i> <i>More waste produced</i> <i>Smaller boards</i> <i>More expensive</i>	<p>2 x 3 marks</p> <p>8 x 2 marks</p>			
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<p>(ii)</p>	<p>Other conversion method...</p> <p><i>Tangential conversion</i></p>	<p>3 + 3 marks</p>												
<p>(iii)</p> 	<p>Name of seasoning methods...</p> <p><i>Air/Natural Seasoning</i> <i>Kiln/Artificial Seasoning</i></p> <p>Seasoning comparison...</p> <table border="1" data-bbox="464 1451 1259 1727"> <thead> <tr> <th></th> <th>Air Seasoning</th> <th>Kiln Seasoning</th> </tr> </thead> <tbody> <tr> <td>Cost</td> <td><i>Inexpensive</i></td> <td><i>Costly to set up and run</i></td> </tr> <tr> <td>Duration</td> <td><i>Slow drying rate</i></td> <td><i>Faster</i></td> </tr> <tr> <td>Moisture Content</td> <td><i>Weather dependent. 18% max</i></td> <td><i>Easier to control</i></td> </tr> </tbody> </table>		Air Seasoning	Kiln Seasoning	Cost	<i>Inexpensive</i>	<i>Costly to set up and run</i>	Duration	<i>Slow drying rate</i>	<i>Faster</i>	Moisture Content	<i>Weather dependent. 18% max</i>	<i>Easier to control</i>	<p>2 x 2 marks</p> <p>6 x 1 mark</p>
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<p>(iv)</p>	<p>Air circulation...</p> <p><i>Stickers or Spacers</i></p>	<p>2 marks</p>												

22

6

10


2

QUESTION	ANSWER	MARKS
<p>4. (i)</p> 	<p>Correct names for specialist tools...</p> <p><i>X = Sliding Bevel</i> <i>Y = Panel/Crosscut saw/Rip saw/ Hand saw</i> <i>Z = Allen/Hex Keys</i></p>	<p>3 x 4 marks</p>
<p>(ii)</p>	<p>Setting a sliding bevel...</p> <p><i>Loosen the thumbscrew or wing nut.</i> <i>Place a protractor/setsquare on the inside of the sliding bevel aligning the blade and stock to the required angle.</i></p> <p><i>Use angle marked on a drawing or timber.</i> <i>Tighten the thumbscrew or wing nut to lock the angle.</i></p> <p>Using a sliding bevel...</p> <p><i>Set the stock on the edge of the work surface.</i> <i>Draw a straight line along the blade of the sliding bevel to mark the cutting angle on your work surface.</i></p>	<p>3 + 4 marks</p> <p>3 + 4 marks</p>
<p>(iii)</p> 	<p>Sawing a tenon...</p> <p><i>Place timber vertically in the vice and saw down 5-10mm on the waste side of the line.</i> <i>Tilt piece at an angle (45° approx) and saw down line closest to you keeping the saw in the initial saw kerf while doing so.</i> <i>Rotate the piece in the vice keeping it at a similar angle and repeat the process.</i> <i>Adjust the timber to an upright position again and saw down to the shoulder line.</i> <i>Place piece on a bench hook and saw down as far as tenon line to remove the waste.</i></p>	<p>3 x 2 + 8</p>

12

14

14


QUESTION	ANSWER	MARKS
5A. (i) 	Clear Finish... <p style="text-align: center;"><i>Varnish, lacquer, beeswax (clear wax), oil (Danish, linseed) liquid paraffin, French polish</i></p> Two reasons... <p style="text-align: center;"><i>Appearance, durability, enhances wood, ease of application, environmentally friendly, safe...</i></p>	4 marks 2 x 3 marks
(ii)	Preparing for a clear finish ... <p style="text-align: center;"><i>Use suitable scraper to remove pencil marks or scratches Raise bruises or dents by sweating with heat and steam Fill any holes or imperfections Sand using abrasive paper, moving from coarse to fine Dust down surfaces Wipe surface with a damp cloth and cut back using a very fine paper or steel wool when dry Wipe down with white spirits</i></p>	6 + 6 marks
(iii)	Applying a clear finish... <p style="text-align: center;"><i>Apply the first coat using a suitable cloth/brush... Allow finish to dry Sand lightly between coats Apply second and subsequent coats sanding lightly between coats Buff if required</i></p>	6 + 6 marks
(iv)	Two safety precautions... <p style="text-align: center;"><i>Safety spectacles Face mask Well-ventilated area Gloves Overalls Avoid eating while using Keep away from naked flames Read instructions carefully</i></p>	2 x 3 marks

10

12

12

6

QUESTION	ANSWER	MARKS	
5B. (i)	Carving Method...		
(a)	<i>Carving in the round</i> <i>3D carving</i> <i>Wood Sculpture</i>	5 marks	
(b)	<i>Relief carving</i> <i>Chip carving</i> <i>Whittling</i> <i>Incised carving</i>	2 x 4 marks	
(ii)	Marking out carving...		13
	<p><i>Draw an elevation(s) and plan(s) of the fish</i> <i>Transfer the images onto the wood by drawing it directly or transferring using carbon paper</i></p>	3 + 6 marks	
	<p>Carving...</p> <p><i>Using a coping saw, band saw or scroll saw cut the shape on one side.</i> <i>Reattach the waste with masking tape and cut the shape on the adjacent face</i> <i>Place the rough out in a vice and using chisels, gouges and other appropriate tools carve the details.</i> <i>Define the final shape of the carving using chisels, gouges, rasps and sandpaper</i> <i>Apply a finish</i></p>	3 + 6 marks	18
(iii)	Three suitable woods...		
	<i>Lime, Beech, Mahogany, Oak, Walnut, Pine, Apple, Cherry, Pear, Plum, Sycamore, Teak, Birch, Elm, Cedar, Holly, Alder, Chestnut...</i>	3 x 2 marks	
	Reasons...		
	<i>Close-grained, appearance, easy to work, attractive grain patterns, free from defects...</i>	3 x 1 marks	
			9

