



Coimisiún na Scrúduithe Stáit
State Examinations Commission

Junior Certificate 2015

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

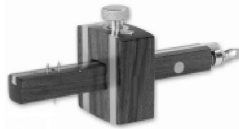












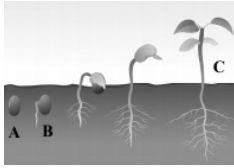

Assumptions about future marking schemes on the basis of past schemes should be avoided. While the underlying assessment principles remain the same, the details of the marking of a particular type of question may change in the context of the contribution of that question to the overall examination in 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.







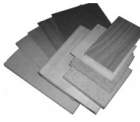



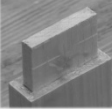
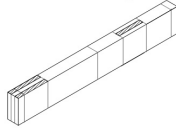


The Sample solutions where shown are presented as example answers.



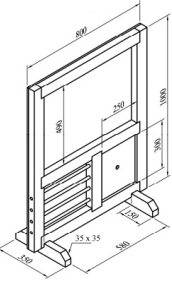
All other valid solutions are acceptable and are marked accordingly.

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... <i>Mortice Gauge/Combination Gauge</i>	 3 marks						
	(ii) Specific use for this tool... <i>To mark lines parallel to the edge of a piece of timber. Marking joints</i>		2 marks					
2.	Safety precautions... <i>Read and observe safety signs/instructions, wear protective equipment, report all accidents, report all breakages and damaged equipment, tie up long hair, remove jewellery, keep hands behind cutting edge, never run, use 110V equipment, disconnect electric tools before adjusting...</i>	 2 x 2 marks 1 x 1 mark						
3.	Adhesives... <i>Scotch glue, PVA, urea formaldehyde resin, epoxy resin, Aliphatic glue, cyanoacrylates, contact adhesive, thermo glue, polyurethane glue, casein glue...</i>	 2 x 2 marks 1 x 1 mark						
4.	(i) Cross section of tree trunk... <i>A = Bark</i> <i>B = Sapwood</i> <i>C = Heartwood</i>	 2 x 2 marks 1 x 1 mark						
5.	(i) Tree identification... <table border="1" style="width: 100%; text-align: center;"> <tr> <td></td> <td></td> <td></td> </tr> <tr> <td>Sycamore</td> <td>Birch</td> <td>Oak</td> </tr> </table>				Sycamore	Birch	Oak	2 x 2 marks 1 x 1 mark
								
Sycamore	Birch	Oak						
6.	Germination... <table style="display: inline-table; vertical-align: middle;"> <tr> <td style="padding-right: 5px;"><i>Radicle</i></td> <td style="border: 1px solid black; text-align: center;">B</td> </tr> <tr> <td style="padding-right: 5px;"><i>Sapling</i></td> <td style="border: 1px solid black; text-align: center;">C</td> </tr> <tr> <td style="padding-right: 5px;"><i>Seed</i></td> <td style="border: 1px solid black; text-align: center;">A</td> </tr> </table> 	<i>Radicle</i>	B	<i>Sapling</i>	C	<i>Seed</i>	A	2 x 2 marks 1 x 1 mark
<i>Radicle</i>	B							
<i>Sapling</i>	C							
<i>Seed</i>	A							
7.	(i) Identify tool... <i>Nail punch</i>	 3 marks						
	(ii) Use... <i>Driving nails and pins below the surface</i>		2 marks					

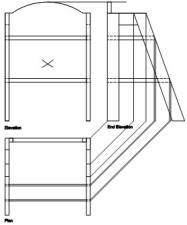
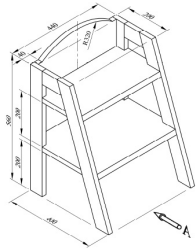
<p>8.</p> 	<p>Methods of conversion...</p> <div style="border: 1px solid black; padding: 2px; margin-bottom: 2px;"><i>Tangential/Box</i></div> <div style="border: 1px solid black; padding: 2px; margin-bottom: 2px;"><i>Quarter</i></div> <div style="border: 1px solid black; padding: 2px; margin-bottom: 2px;"><i>Radial/Rift</i></div> <div style="border: 1px solid black; padding: 2px;"><i>Through and through/Slash/Plain/Crown</i></div>	<p>2 x 2 marks 1 x 1 mark</p>
<p>9.</p>	<p>Beech defect... <i>Spalt/Spalting/Spalted</i></p>	 <p>5 marks</p>
<p>10. (i)</p>	<p>Name of tool... <i>Pointed/Long-nose /Needle-nose Pinch-nose/Snipe-nose pliers</i></p>	 <p>3 marks</p>
<p>(ii)</p>	<p>Use... <i>Cutting, holding...</i></p>	<p>2 marks</p>
<p>11.</p>	<p>Veneering... <i>Marquetry</i></p>	 <p>3 marks</p>
	<p>Glue... <i>Scotch glue, PVA, urea formaldehyde resin, epoxy resin, aliphatic gluecontact adhesive, thermo glue, polyurethane glue, casein glue</i></p>	 <p>2 marks</p>
<p>12.</p>	<p>Applying preservatives... <i>Brush, Dipping/Immersion, Roller, Pressure/Vacuum treatment, Spraying</i></p>	 <p>2 x 2 marks 1 x 1 mark</p>
<p>13.</p>	<p>Manufactured boards... <i>Plywood, MDF, HDF, chipboard, OSB/Stirling board, blockboard, laminboard, battenboard, pineboard/lamwood, hardboard, softboard...</i></p>	 <p>5 x 1 mark</p>
<p>14.</p>	<p>Woodturning items...</p> <div style="display: flex; justify-content: space-around; align-items: center;">    </div> <div style="display: flex; justify-content: space-around; margin-top: 10px;"> <div style="border: 1px solid black; padding: 2px;"><i>Live/revolving centre</i></div> <div style="border: 1px solid black; padding: 2px;"><i>Outside calliper</i></div> <div style="border: 1px solid black; padding: 2px;"><i>Faceguard/shield/visor</i></div> </div>	<p>2 x 2 marks 1 x 1 mark</p>
<p>15.</p> 	<p>Mortice and tenon sketch ...</p> 	<p>1 x 3 marks 1 x 2 marks</p>
<p>16.</p>	<p>EMC... <i>Equilibrium Moisture Content</i></p>	 <p>2 x 2 marks 1 x 1 mark</p>
<p>17. (i)</p>	<p>Force... <i>Torsion /torque</i></p>	 <p>3 marks</p>
<p>(ii)</p>	<p>Other force... <i>Compression, shear, tension, bending, gravitational, frictional, magnetic...</i></p>	<p>2 marks</p>


<p>18.</p> 	<p>Jewellery making...</p> <table border="1" data-bbox="354 206 1203 510"> <thead> <tr> <th>Metals</th> <th>Ferrous</th> <th>Non Ferrous</th> </tr> </thead> <tbody> <tr> <td>Aluminium</td> <td></td> <td>✓</td> </tr> <tr> <td>Tin</td> <td></td> <td>✓</td> </tr> <tr> <td>Lead</td> <td></td> <td>✓</td> </tr> <tr> <td>Mild Steel</td> <td>✓</td> <td></td> </tr> <tr> <td>Silver</td> <td></td> <td>✓</td> </tr> </tbody> </table>	Metals	Ferrous	Non Ferrous	Aluminium		✓	Tin		✓	Lead		✓	Mild Steel	✓		Silver		✓	<p>5 x 1 marks</p>																						
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<p>19.</p> 	<p>(i) Machine... <i>Morticer</i></p> <p>(ii) Safety precautions... <i>Wear protective equipment, secure work piece, tie up long hair, remove jewellery, keep hand away from the cutting edge, read and observe safety instructions, disconnect electric tools before adjusting...</i></p>	<p>3 marks</p> <p>2 x 1marks</p>																																								
<p>20.</p> 	<p>Cutting list...</p> <table border="1" data-bbox="341 967 1209 1424"> <thead> <tr> <th>Description</th> <th>Quantity</th> <th>Length</th> <th>Width</th> <th>Thickness</th> </tr> </thead> <tbody> <tr> <td>Sides</td> <td>2</td> <td>1000</td> <td>70</td> <td>40</td> </tr> <tr> <td>Cross Rail</td> <td>1</td> <td>700</td> <td>70</td> <td>40</td> </tr> <tr> <td>Middle Upright</td> <td>3</td> <td>340</td> <td>70</td> <td>40</td> </tr> <tr> <td>Whiteboard Backing</td> <td>2</td> <td>1000</td> <td>800</td> <td>10</td> </tr> <tr> <td>Feet</td> <td>2</td> <td>350</td> <td>70</td> <td>40</td> </tr> <tr> <td>Clock Face</td> <td>1</td> <td>300</td> <td>250</td> <td>10</td> </tr> <tr> <td>Dowels</td> <td>4</td> <td>480</td> <td colspan="2">Ø15</td> </tr> </tbody> </table>	Description	Quantity	Length	Width	Thickness	Sides	2	1000	70	40	Cross Rail	1	700	70	40	Middle Upright	3	340	70	40	Whiteboard Backing	2	1000	800	10	Feet	2	350	70	40	Clock Face	1	300	250	10	Dowels	4	480	Ø15		<p>5 x 1 mark</p>
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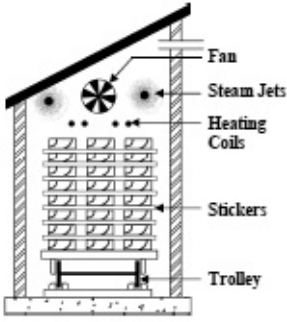
Running total of allowed questions for this section to be recorded and shown as indicated at the marking conference.

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 (560)</i></p> <p><i>Showing overall width (440)</i></p> <p><i>Showing thickness of legs (20)</i></p> <p><i>Showing position and thickness of shelves (20 either)</i></p> <p><i>Showing either end of curve</i></p> <p><i>Locating centre</i></p> <p><i>Drawing curve</i></p>	<p>1 mark</p> <p>1 mark</p> <p>2 x 1 mark</p> <p>2 x 1 mark</p> <p>1 mark</p> <p>2 marks</p> <p>1 mark</p>
<p>(ii)</p> 	<p>End View -</p> <p><i>Setting out/transferring height (560)</i></p> <p><i>Setting out/transferring depth(200 & 400)</i></p> <p><i>Position and width of front leg (60)</i></p> <p><i>Width of back leg (560x60)</i></p> <p><i>Position and thickness of shelves (either)</i></p> <p><i>Width of top rail (60)</i></p> <p><i>Position and thickness of back (20)</i></p>	<p>1 mark</p> <p>2 marks</p> <p>2 marks</p> <p>1 mark</p> <p>2 x 1 mark</p> <p>1 mark</p> <p>2 x 1 mark</p>
<p>(iii)</p>	<p>Plan -</p> <p><i>Setting out/transferring overall width (440)</i></p> <p><i>Setting out depth (400)</i></p> <p><i>Showing thickness of back (20)</i></p> <p><i>Showing position top rails (200)</i></p> <p><i>Showing thickness of legs (20)</i></p> <p><i>Showing position and thickness of (either) shelves</i></p> <p><i>Showing ends of curve (either)</i></p> <p><i>Joint lines (2 on one side)</i></p>	<p>1 mark</p> <p>1 mark</p> <p>1 mark</p> <p>2 x 1 mark</p> <p>2 x 1 mark</p> <p>2 x 1 marks</p> <p>1 mark</p> <p>2 x 1 mark</p>
	<p>General -</p> <p><i>Scale</i></p> <p><i>Draughtsmanship, presentation...</i></p>	<p>2 marks</p> <p>5 marks</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>10</p> <p>11</p> <p>12</p> <p>7</p>

QUESTION	ANSWER	MARKS
2. (i)	<p>Explanation of steps in design process...</p> <p>Sketches/Working Drawings -</p> <p><i>Dimensioned drawings to include plan, elevation and end elevation and/or a pictorial view of the proposed artefact and sketches relating to its manufacture. Appropriate detailing and a materials list should be included.</i></p> <p>Design Ideas/Solutions-</p> <p><i>Proposals based on the analysis of the brief and the investigation/research carried out that should meet all the requirements. One design idea or elements from several ideas can be brought together into the selected solutions.</i></p>	<p>5 marks</p> <p>5 marks</p>
(ii)	 <p>Design solution for wooden storage 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, portable unit. (Must include notes)</i></p> <p><i>Good, well balanced, well sketched design, showing some innovation and creativity. (Must be in 3D or 2 orthographic views 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>↓</p> <p>6 marks</p> <p>↓</p> <p>9 marks</p> <p>↓</p> <p>12 marks</p> <p>↓</p> <p>16 marks</p>
(iii)	<p>Two specific design requirements ...</p> <p><i>Any two relevant requirements to the design</i> <i>Access, safety, appearance, function, stability, size, shape, proportion, suitability...</i></p>	<p>2 x 3 marks</p>
(iv)	<p>Incorporation of design requirements...</p> <p><i>Notes and sketches must relate to part (iii)</i></p>	<p>2 + 2 marks</p> <p>2 + 2 marks</p>
		<p>10</p> <p>16</p> <p>6</p> <p>8</p>

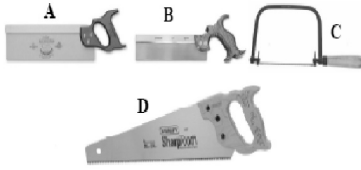
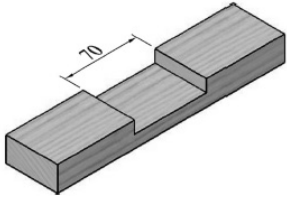
QUESTION	ANSWER	MARKS												
3. (i)	<p>Method of Seasoning...</p> <p>Kiln Seasoning (Compartment/ Progressive) Artificial Seasoning</p> 	5 marks												
(ii)	<p>Function of the kiln parts...</p> <ul style="list-style-type: none"> • Fans are used to circulate the steam and warm air to heat the stack uniformly. • Heated steam is piped into kiln through the steam jets to warm up whole stack and prevent rapid drying. • Heating coils warm the air and humidity is reduced slowly. • Timber is stacked on a trolley for ease of movement. • Stickers between each plank to allow circulation. 	5 x 2 marks												
(iii)	<p>Other seasoning method...</p> <p>Natural/Air Seasoning</p> <table border="1" data-bbox="316 1115 1203 1429"> <thead> <tr> <th>Disadvantages</th> <th>Advantages</th> </tr> </thead> <tbody> <tr> <td>Slow</td> <td>Inexpensive</td> </tr> <tr> <td>No control over final MC</td> <td>Easily managed/set-up</td> </tr> <tr> <td>MC of only circa 18% achievable</td> <td>No specialist labour required</td> </tr> <tr> <td>Weather dependent</td> <td>No expensive equipment needed</td> </tr> <tr> <td>Boards prone to fungus/insect attack</td> <td>Not wasteful of energy</td> </tr> </tbody> </table>	Disadvantages	Advantages	Slow	Inexpensive	No control over final MC	Easily managed/set-up	MC of only circa 18% achievable	No specialist labour required	Weather dependent	No expensive equipment needed	Boards prone to fungus/insect attack	Not wasteful of energy	5 marks 2 x 2 marks 2 x 2 marks
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(iv)	<p>Defects caused by seasoning...</p> <p>Warping, cupping, bowing, twisting, springing: Place weight on the stack, correct sticker alignment, uniform sticker size. Correct stacking Check, split, shake. Cover ends of timber with paint sacking or metal cleats. Use of steam during seasoning. Use correct drying schedule Case hardening: Use correct drying schedule Collapse. Use correct drying schedule Honeycombing. Use correct drying schedule Staining. Using lower temperatures initially in the drying process to prevent fungal growth</p>	3 x 1 marks 3 x 2 marks 3 x 1 marks												

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13

12

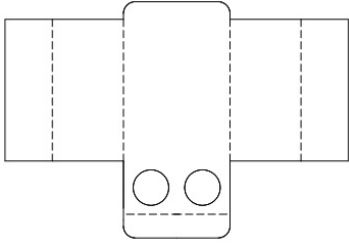
QUESTION	ANSWER	MARKS
4. (i)	<p>Name of saws...</p> <p><i>A = Tenon/Back Saw cutting light sections and joints</i></p> <p><i>B = Dovetail Saw/Back Saw cutting light sections and joints</i></p> <p><i>C = Coping Saw cutting curves</i></p> <p><i>D = Hand/Panel Crosscut/RipSaw ripping/crosscutting large sections</i></p> 	<p>4 x 2 marks 4 x 1 marks</p>
(ii)	<p>Teeth face the handle ...</p> <p><i>Lends itself to a more accurate cut Blade is less likely to twist, bend or break as there is better tension</i></p>	<p>5 marks</p>
(iii)	<p>Replacing the blade...</p> <ul style="list-style-type: none"> • <i>Remove the broken blade</i> • <i>Turn handle anti-clockwise to reduce gap between retaining pins</i> • <i>Fit blade at the toe of the saw ensuring teeth point towards the handle</i> • <i>Flex the frame against the bench to locate the other end of the blade</i> • <i>Holding its retaining pin tighten the handle to tension the blade</i> • <i>Align the retaining pins</i> 	<p>6 + 3 marks</p>
(iv)	<p>Marking out of trench...</p> <p><i>Measure and mark width of trench Square lines the width of the wood across the timber. Return lines across each edge. Set gauge to required depth Gauge between lines on both edges. Cuts lies with a marking knife. Mark waste</i></p>  <p>Removing trench...</p> <p><i>Secure wood in a vice/bench hook. Saw lines on waste side across face as far as gauge line. Saw a line in the middle of the trench almost as far as the gauge line. Using a chisel remove waste from each edge working upwards at an angle . Repeat from the other edge. Pare across trench removing waste timber from one gauge line to the other.</i></p>	<p>4 + 3 marks</p> <p>4 + 3 marks</p>

12

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14



QUESTION	ANSWER	MARKS
5A. (i)	<p>Development of menu holder...</p> <p><i>Neat well-proportioned sketch of development showing correct cutting pattern and fold lines</i></p> <p><i>Surfaces (6)</i> <i>Fold Lines (2/5)</i> <i>Fillets (2/4)</i> <i>Quality of drawing</i></p> 	<p>3 x 2 mark 2 x 1 mark 2 x 1 mark 2 marks</p>
(ii)	<p>Cut out and form holder...</p> <ul style="list-style-type: none"> • <i>Cut out shape of holder using a scroll saw, hacksaw or equivalent</i> • <i>File edges to the lines and finish by draw filing and or carbon silicate paper</i> • <i>Process holes</i> • <i>Mark fold lines with non-permanent pen</i> • <i>Place fold lines over strip heater</i> • <i>Bend to the correct angle using a former.</i> 	<p>2 + 4 marks</p> <p>2 + 4 marks</p>
(iii)	<p>Drilling two large holes...</p> <ul style="list-style-type: none"> • <i>Mark centres for holes</i> • <i>Place waste wood beneath acrylic /place tape on front and back of acrylic</i> • <i>Secure acrylic in vice or cramp</i> • <i>Using a hole saw set drill to low speed</i> • <i>Drill through slowly (from each side)</i> <p>Or</p> <ul style="list-style-type: none"> • <i>Find centres and draw circles on acrylic</i> • <i>Drill series of holes inside the circumference with waste wood beneath</i> • <i>File acrylic to line with (half)round file</i> <p>Or</p> <ul style="list-style-type: none"> • <i>Find centres and draw circles on acrylic</i> • <i>Drill hole on circumference with waste wood beneath</i> • <i>Insert scroll saw, fretsaw blade through hole</i> • <i>Holding acrylic securely and saw to the line</i> • <i>Finish with appropriate file</i> 	<p>4 + 6 marks marks</p>
(iv)	<p>Drilling four small holes...</p> <ul style="list-style-type: none"> • <i>Mark centres for holes</i> • <i>Place waste wood beneath acrylic / Place tape on front and back of acrylic</i> • <i>Secure acrylic in vice or cramp</i> • <i>Set drill to appropriate speed</i> • <i>Drill through slowly using a twist bit</i> • <i>Countersink</i> • <i>Drill a pilot hole to accommodate the shank of the screws</i> • <i>Insert screws ensuring acrylic is tight to the base</i> 	<p>3 + 3 marks</p>

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QUESTION	ANSWER	MARKS
5B. (i)	Carving methods... <i>A= Chip carving</i> <i>B= Relief carving</i> <i>C= Carving in the Round/ Wood Sculpture</i>	 3 x 4 marks
(ii)	Transferring design to wood ... <ul style="list-style-type: none"> • <i>Tape the carving drawing to one edge of the wood.</i> • <i>Insert a sheet of carbon paper underneath the drawing.</i> • <i>Trace over the design.</i> • <i>Check all lines are visible on the wood before removing sheets.</i> <p style="text-align: center;">OR</p> <ul style="list-style-type: none"> • <i>Cut around carving drawing.</i> • <i>Tape this template to the wood.</i> • <i>Trace around the template with a pencil.</i> • <i>Sketch in missing parts as accurately as possible</i> 	4 + 6 marks
(iii)	Use of laminates... <i>Strength</i> <i>Less waste</i> <i>No short grain</i> <i>Added feature</i> <i>Appearance</i>	 2 x 3 marks
(iv)	Forming laminates... <ul style="list-style-type: none"> • <i>Prepare formwork to the specified shape</i> • <i>Cut laminates to width and thickness</i> • <i>Dry clamp laminates in the formwork</i> • <i>Apply glue to laminates</i> • <i>Insert in formwork</i> • <i>Apply pressure using clamps</i> • <i>Leave for 24hrs to set (depending on adhesive used)</i> • <i>Remove clamps and formwork</i> • <i>Plane edges and cut to size</i> • <i>Prepare and apply a suitable finish</i> 	6 + 6 marks

12

10

6

12

