



Coimisiún na Scrúduithe Stáit
State Examinations Commission

Junior Certificate 2019

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.



Coimisiún na Scrúduithe Stáit
State Examinations Commission

Junior Certificate Examination 2019

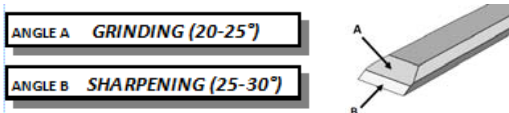
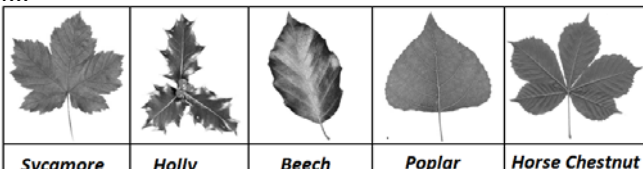
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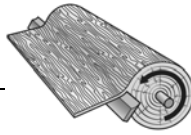
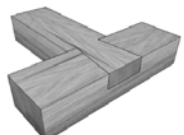
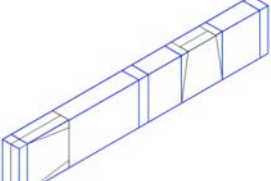


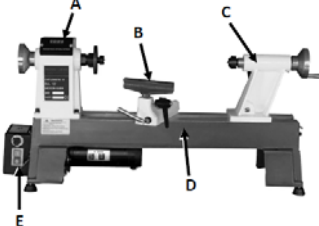
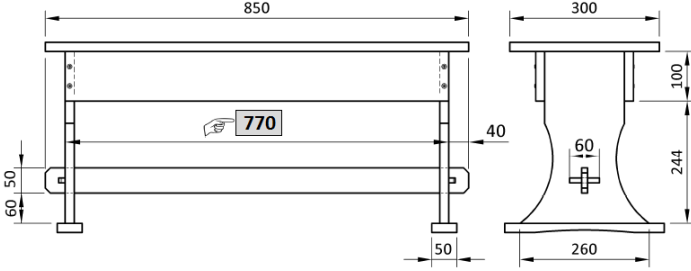
*The Sample solutions shown are presented as example answers.
All other valid solutions are acceptable and are marked
accordingly.*

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... Marking Gauge	3 marks
(ii)	Specific use for this tool... To mark lines parallel to a surface, mark out joints, gauge lines...	2 marks
2. (i)	Edge moulding... Chamfer/Bevel	3 marks
(ii)	Method of applying moulding... Using a block plane, chisel, router, sander, rasp.	2 marks
3. (i)	Common hinge... Rising Butt Hinge	3 marks
(ii)	Use... To raise door when opening, self-closing.	2 marks
4. (i)	Tool... Pincers	3 marks
(ii)	Specific Use... Pulling nails, cutting wire...	2 marks
5. (i)	CAM... Computer Aided/Assisted Manufacture/Machining	3 marks
(ii)	Advantage... Accuracy, speed, reproduction, safety...	2 marks
6. (i)	Board distortion... Cupping/Cup	3 marks
(ii)	Cause... Uneven shrinkage, poor stacking, poor seasoning/conversion method.	2 marks
7.	Steps in finishing ... 	5 x 1mark
8.	Chisel maintenance... 	3 marks 2marks
9.	Tree Identification... 	5 x 1 marks

10.	(i)	Wood preparation ... Rotary Knife/Veneer cutting		3 marks
	(ii)	Use... Veneering, decorative work, preserving hardwoods...		2 marks
11.	(i)	Name the tool shown... G-Cramp		3 marks
	(ii)	Use... Holding pieces, gluing, assembly...		2 marks
12.	(i)	Wiring of three pin plug... BROWN LIVE BLUE NEUTRAL GREEN/YELLOW EARTH 		3 x 1mark
	(ii)	Function of fuse... Safety in case of overload or short circuit...		2 marks
13.	(i)	Plastic bending machine... Strip heater		3 marks
	(ii)	Type of Acrylic... Thermoplastic		2 marks
14.		Moisture Content... $\frac{\text{Wet Weight} - \text{Dry Weight}}{\text{Dry Weight}} \times 100 = \frac{21.6 - 20}{20} \times 100 = 8\%$		5 marks
15.	(i)	Woodworking machine... Band saw		3 marks
	(ii)	Function of A... Blade Tensioning		1 mark
	(iii)	Precautions... Eye ear protection adjust guard to suit work piece, ensure hands are not in line with the blade, do not adjust while in use...		1 mark
16.	(i)	Force... Torque/Torsion		3 marks
	(ii)	Other forces... Shear, Tension, Compression, Magnetic, Bending, Gravitational...		2marks
17.		Dovetail Halving...   		3 marks 2 marks

18.	Hardwoods or Softwood...  <table><tr><th>Hardwood</th><th>Trees</th><th>Softwood</th></tr><tr><td>✓</td><td>Birch</td><td></td></tr><tr><td></td><td>Cedar</td><td>✓</td></tr><tr><td></td><td>Norway Spruce</td><td>✓</td></tr><tr><td></td><td>Larch</td><td>✓</td></tr><tr><td>✓</td><td>Willow</td><td></td></tr></table> 	Hardwood	Trees	Softwood	✓	Birch			Cedar	✓		Norway Spruce	✓		Larch	✓	✓	Willow		5 x 1 marks																											
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19.	Woodturning Lathe... A Headstock B Tool rest C Tailstock D Bed E On/Off Switch 	5 x 1 marks																																													
20.	Cutting List...   <table><tr><th>Description</th><th>Quantity</th><th>Length</th><th>Width</th><th>Thickness</th></tr><tr><td>Bench Top</td><td>1</td><td>850</td><td>300</td><td>18</td></tr><tr><td>Vertical Sides</td><td>2</td><td>344</td><td>260</td><td>18</td></tr><tr><td>Top Horizontal Rails</td><td>2</td><td>770</td><td>100</td><td>18</td></tr><tr><td>Base Legs</td><td>2</td><td>320</td><td>50</td><td>18</td></tr><tr><td>Bottom Horizontal Rails</td><td>1</td><td>850</td><td>50</td><td>18</td></tr><tr><td>Wedge</td><td>2</td><td>60</td><td>12</td><td>10</td></tr><tr><td>Brass Screws</td><td>8</td><td>40</td><td colspan="2">Ø4</td></tr><tr><td>Screw Cups</td><td>8</td><td colspan="3">Ø10</td></tr></table>	Description	Quantity	Length	Width	Thickness	Bench Top	1	850	300	18	Vertical Sides	2	344	260	18	Top Horizontal Rails	2	770	100	18	Base Legs	2	320	50	18	Bottom Horizontal Rails	1	850	50	18	Wedge	2	60	12	10	Brass Screws	8	40	Ø4		Screw Cups	8	Ø10			5 x 1 mark
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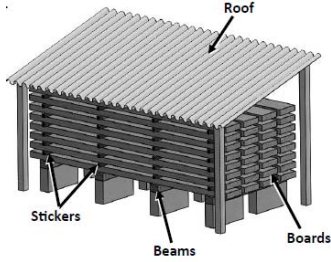
Running total of allowed questions for this section to be recorded and shown as indicated at the marking conference.

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	
1. (i)	Preparation of working drawing ... Elevation - <i>Setting out overall height (780 without curve)</i> <i>Showing overall width (480)</i> <i>Showing thickness (20) of either leg</i> <i>Top edge of back rail</i> <i>Showing position and height of any box</i> <i>Locating end point centre and drawing of arc(280)</i>	1 mark 1 mark 1 mark 1 mark 2 x 1 mark 3 x 1 mark	9
(ii)	End View - <i>Setting out/transferring height (with curve)</i> <i>Setting out depth (520)</i> <i>Locating height and width of any box</i> <i>Position and width of vertical leg</i> <i>Position and width of angled leg</i> <i>Position and width of side rail</i> <i>Position and thickness of curved back</i>	1 mark 1 marks 2 x 1 mark 2 x 1 marks 2 x 1 mark 2 x 1 mark 2 x 1 mark	12
(iii)	Plan - <i>Setting out overall width (480)</i> <i>Setting out overall depth (520)</i> <i>Thickness of back (20)</i> <i>Thickness of either leg (20)</i> <i>Position of front of any two boxes</i> <i>Showing wall thickness of any box(20)</i> <i>Locating top cut off of either leg</i> <i>Locating bottom of either angled leg</i>	1 mark 1 mark 1 mark 1 mark 2 x 1 mark 1 mark 1 mark 1 mark	9
	General - Draughtsmanship, presentation... NOTE: 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. 3. If sketched, mark as per instructions at conference.	3 marks	3
(iv)	Joining the leg L to the rail R... <i>Mortice and tenon, Housed joint, Halving, Dowel, Biscuit, Domino, Screws(and cups), sunk and plugged/concealed</i> <i>Description/name only</i>	5 + 2 marks 2 marks	7

QUESTION	ANSWER	MARKS	
2. (i)	Explanation of steps in design process... Analysis: <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> Evaluation: <i>A review of the process of designing and making the artefact where fitness for purpose, appearance, use of materials, processes, modifications, time-management, safety and stability are considered.</i>	5 marks 5 marks	10
(ii) 	Design solution for Storage Unit... <i>Basic unit/box without any design features (sketch only)</i> <i>Fair attempt to store items in an attractive, suitable, unit. (Must include notes)</i> <i>Good, well balanced, well sketched design, showing some innovation and creativity. (Must be in 3D or 2 orthographic views and include notes)</i> <i>A <u>quality</u> 3D sketch of an original innovative and creative design. The sketch must be rendered or shaded and include relevant notes</i>	↓ 6 marks ↓ 9 marks ↓ 12 marks ↓ 16 marks	16
(iii)	Woodwork joint... <i>Appropriate jointing method for the proposed design presented.</i>	3 + 3 marks	6
(iv)	Lid attachment description... <i>Method of fixing a hinge to a door or lid. Allow for sliding, pivoting, tambour or other appropriate method.</i>	4 + 4 marks	8

QUESTION	ANSWER	MARKS															
3. (i)	Advantages of Seasoning Timber... <i>Timber is lighter, stronger, harder, more stable, and easier to work.</i> <i>Better at taking adhesives, finishes and preservatives.</i> <i>More resistant to fungal attack...</i> 	3 x 3 marks															
(ii)	Correct method of Seasoning... <i>Air or Natural Seasoning</i> <i>Boards are placed on blocks and beams to allow air to circulate freely around the stack and to raise stack off the ground</i> <i>The roof protects the boards from direct sunlight and rain</i> <i>Stickers are placed between the boards to allow air to flow around each plank helping them to dry</i>	4 marks 4 x 2 + 4 marks															
(iii)	Name of other Seasoning Method... <i>Kiln/Progressive/Artificial Seasoning</i> Comparison... <table border="1"> <thead> <tr> <th>Headings</th><th>Air Seasoning</th><th>Kiln Seasoning</th></tr> </thead> <tbody> <tr> <td>Moisture Content</td><td>Minimum MC 18%</td><td>Achieves a MC of 6-8 %</td></tr> <tr> <td>Duration</td><td>Very slow, takes up to a year to dry 25mm</td><td>Quicker, 25mm can be dried in hours/days</td></tr> <tr> <td>Defects</td><td>End splits predominantly</td><td>More susceptible to drying defects</td></tr> <tr> <td>Cost</td><td>Inexpensive</td><td>Expensive</td></tr> </tbody> </table>	Headings	Air Seasoning	Kiln Seasoning	Moisture Content	Minimum MC 18%	Achieves a MC of 6-8 %	Duration	Very slow, takes up to a year to dry 25mm	Quicker, 25mm can be dried in hours/days	Defects	End splits predominantly	More susceptible to drying defects	Cost	Inexpensive	Expensive	3 marks 4 x 2 marks
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Cost	Inexpensive	Expensive															
(iv)	Protect Plank Ends... <i>Covering with a fabric, paint / varnish, fixing a metal or wooden cleat.</i> 	2 + 2 marks															

QUESTION	ANSWER	MARKS																																			
4. (i)	Names of boring tools... A = Cordless Drill B = Brace C = Wheel /Hand Drill D = Drill Press, Pillar/Bench/Machine Drill 	4 x 3 marks																																			
(ii)	Table Comparison... <table><tr><th>Tool</th><th>Portability</th><th>Boring Speed</th><th>Boring Depth</th><th>Safety</th><th>Cost</th><th>Accuracy</th></tr><tr><td>Cordless Drill</td><td>Very Good</td><td>Variable</td><td>Good</td><td>Medium risk</td><td>Medium</td><td>Fair/Good</td></tr><tr><td>Brace</td><td>Very Good</td><td>Limited</td><td>Good</td><td>Low Risk</td><td>Low</td><td>Fair/Poor</td></tr><tr><td>Wheel Drill</td><td>Very Good</td><td>Limited</td><td>Limited to smaller bits</td><td>Low Risk</td><td>Low</td><td>Fair/Poor</td></tr><tr><td>Bench Drill</td><td>Poor</td><td>Variable</td><td>Very good</td><td>Highest risk</td><td>High</td><td>Very Good</td></tr></table>	Tool	Portability	Boring Speed	Boring Depth	Safety	Cost	Accuracy	Cordless Drill	Very Good	Variable	Good	Medium risk	Medium	Fair/Good	Brace	Very Good	Limited	Good	Low Risk	Low	Fair/Poor	Wheel Drill	Very Good	Limited	Limited to smaller bits	Low Risk	Low	Fair/Poor	Bench Drill	Poor	Variable	Very good	Highest risk	High	Very Good	4 x 2 marks
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(iii)	Adjustment features of the Bench Drill... Table Height Bit Size Feed Speed Safety Guard Rotation Speed Table Angle 	6 + 5 marks																																			
(iv)	Safety Precautions... Use appropriate speed Secure the work piece Wear eye protection Tie back long hair Remove jewellery Avoid wearing loose clothing Remove chuck key Place waste timber beneath Reason... Mark for appropriate reason relating to chosen precaution	3 x 2 mark																																			
		3 x 1 mark																																			

12

8

11

9

QUESTION	ANSWER	MARKS	
5A. (i) 	Transferring design to wood ... • <i>Tape the drawing to the wooden veneer.</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 veneer before removing sheets.</i>	3 x 2 + 6 marks	12
(ii)	Marquetry... • <i>Apply tape to reinforce.</i> • <i>Cut the design accurately with a sharp knife</i> • <i>Keep knife upright on the veneer.</i> • <i>Place this veneer over the other veneer(s), ensuring grain is in right direction</i> • <i>Cut shape accurately through the gap/window.</i> • <i>Apply tape to reinforce.</i> • <i>Place the veneers on above the other and tape them together.</i> • <i>Cut design accurately through both keeping the knife upright.</i> • <i>Trim to fit if required</i>	3 x 2 + 6 marks	
(iii)	Veneers conserve rare woods... • <i>Used in conjunction with manufactured boards to give the same effect as solid wood but uses only a fraction of the timber</i> • <i>Very little timber is wasted in production</i>	4 marks	4
(iv) 	Cutting of Slots... • <i>Drill a hole at each end of the slot drilling from both sides or with a waste piece behind</i> • <i>Remove blade from fret saw, coping saw or scroll saw if required and pass through a hole and reattach</i> • <i>Cut the timber with suitable saw (fret saw, coping saw, jig saw or scroll saw) on the waste side of the lines until the centre piece is removed</i> • <i>Sand to finish wrapping sand paper around a suitable dowel</i> OR • <i>Insert a straight in the router (preferably of similar radius to the slot ends)</i> • <i>Set router fence to the required distance and router depth to allow for more than one pass</i> • <i>Sand to finish using dowel or other appropriate method</i>	3 x 2 + 6 marks	

QUESTION	ANSWER	MARKS											
5B. (i)	Advantages and disadvantages of laminating...												
	<table><tr><th>Advantages</th><th>Disadvantages</th></tr><tr><td>Stronger</td><td>Requires formwork</td></tr><tr><td>Decorative</td><td>A lot of waste</td></tr><tr><td>Smaller section required</td><td>Visible glue lines</td></tr><tr><td>Can use timber offcuts</td><td>Time consuming</td></tr></table>	Advantages	Disadvantages	Stronger	Requires formwork	Decorative	A lot of waste	Smaller section required	Visible glue lines	Can use timber offcuts	Time consuming	2 x 3 marks 2 x 3 marks	12
Advantages	Disadvantages												
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(ii)	Producing a laminated rocker ... • Prepare formwork to the specified shape • Cut laminates to width and thickness • Dry clamp laminates in the formwork • Apply glue to laminates • Place in formwork • Apply pressure using clamps • Leave for 24hrs to set • Remove clamps and formwork • Plane edges and cut to size • Prepare and apply a suitable finish	3 x 2 + 6 marks	12										
(iii)	Appropriate clear finish... Varnishes: Polyurethane Water based, Oils: Danish, Tung, Linseed French Polish, Lacquer, Wax Reasons... Hardwearing, easy to apply, easily renewed, water resistant, easy to clean, enhances the wood, scratch resistant, good quality finish, available in different finishes (varnish and lacquer), can be renewed easily...	2 marks 2 x 2 marks	6										
(iv)	Preparation for finish... • 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. Applying a clear finish... • Apply the first coat using a suitable cloth/brush/rubber... • Allow finish to dry • Sand lightly between coats (if appropriate) • Apply second and subsequent coats (sanding lightly between coats)	5 marks 5 marks	10										