



Coimisiún na Scrúduithe Stáit
State Examinations Commission

Junior Certificate 2017

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.



Junior Certificate Examination 2017
















Materials Technology Wood
Higher Level
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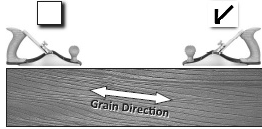

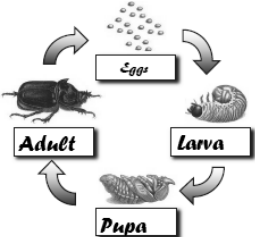



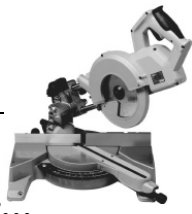




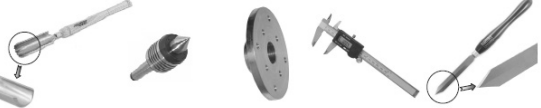
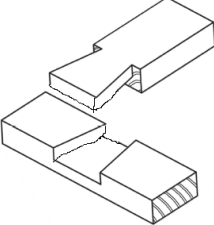
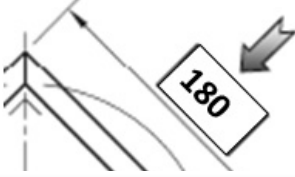
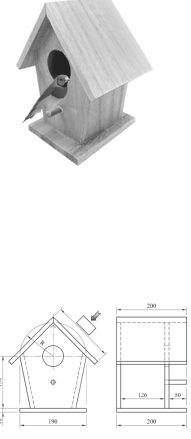
*The Sample solutions shown are presented as example answers.
All other valid solutions are acceptable and are marked accordingly.*

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... <i>Tenon/Back/Dovetail Saw</i>	3 marks										
	(ii) Specific use for this tool... <i>To cut joints, timber, tenons...</i>	2 marks										
2.	PVA... <i>Poly Vinyl Acetate</i>	2 x 2 marks 1 x 1 mark										
3.	(i) Woodworking machine... <i>Pillar/Pedestal/Bench Drill/Drilling Machine...</i>	3 marks										
	(ii) Safety features... <i>Chuck guard, emergency stop, table lock, secured base, depth stop, CE mark, keyless chuck...</i>	2 x 1 mark										
4.	(i) Part A... <i>Bast/Cambium/Inner bark/Bark</i>	3 marks										
	(ii) Function of part A... <i>Transport/cell production, protect ...</i>	2 marks										
5.	(i) Vice jaws... <i>Hold timber without damaging it or marking it</i>	3 marks										
	(ii) Force... <i>Compression...</i>	2 marks										
6.	Identity of trees... <table border="1" style="width: 100%; text-align: center; border-collapse: collapse;"> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>Sycamore</td> <td>Horse Chestnut</td> <td>Rowan</td> <td>Oak</td> <td>Beech</td> </tr> </table> or Mountain Ash						Sycamore	Horse Chestnut	Rowan	Oak	Beech	5 x 1 mark
												
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7.	Kiln Seasoning... <table style="width: 100%; border-collapse: collapse;"> <tr><td style="border: 1px solid black; padding: 2px;">1. FAN</td></tr> <tr><td style="border: 1px solid black; padding: 2px;">2. STEAM JETS</td></tr> <tr><td style="border: 1px solid black; padding: 2px;">3. HEATING COILS</td></tr> <tr><td style="border: 1px solid black; padding: 2px;">4. STICKERS/SPACERS</td></tr> <tr><td style="border: 1px solid black; padding: 2px;">5. TROLLEY</td></tr> </table>	1. FAN	2. STEAM JETS	3. HEATING COILS	4. STICKERS/SPACERS	5. TROLLEY	5 x 1 mark					
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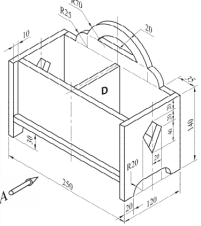
8.	(i)	Woodworking tool... Cross pein/Warrington/Pin Hammer		3 marks
	(ii)	Function of X... Nailing/driving panel pins		2 marks
9.	(i)	Direction for planing... From right to left		3 marks
	(ii)	Reason... Easier, better finish, smoother...		2 marks
10.	(i)	Name of tool... Marking knife.		3 marks
	(ii)	Use... Scoring/Cutting fine lines across the grain		2 marks
11.	(i)	Wood-boring beetle... Larva, Pupa, Adult		3 x 1 mark
	(ii)	Damaging stage... Larva		2 marks
12.	(i)	Method of conversion... Radial, quarter sawn, rift		3 marks
	(ii)	Other conversion method... Tangential/Box/Through and through/Slash Sketch		1 mark 1 mark
13.		Raw materials for photosynthesis... Sunlight, Carbon dioxide, Sap (water and minerals), Chlorophyll		2 x 2 marks 1 mark
14.	(i)	Name of power tool... Mitre Saw, Chopsaw, Crosscut Saw...		3 marks
	(ii)	Precaution... Wear goggles, tie up long hair, no loose clothing, secure the workpiece...		2 marks
15.	(i)	CNC... Computer Numerical Control		3 x 1 mark
	(ii)	Advantage of CNC... Accurate, fast, easily reproduced, safer...		2 marks
16.	(i)	Craft technique... Marquetry		3 marks
	(ii)	Name and use of associated tool... Craft knife/scalpel, steel rule, clamp, cutting mat, veneer hammer/roller, veneer saw, veneer press...		2 x 1 mark


17.	Woodturning items... <i>(Roughing out) Gouge</i> <i>(Live/revolving)Centre</i> <i>Faceplate</i> <i>Vernier caliper</i> <i>Parting Tool</i>  <table border="1" data-bbox="746 250 1289 309"> <tr> <td>1.</td> <td>2.</td> <td>3.</td> <td>4.</td> <td>5.</td> </tr> <tr> <td>Roughing Gouge</td> <td>Live/revolving Centre</td> <td>Faceplate</td> <td>Vernier Calipers</td> <td>Parting Tool</td> </tr> </table>	1.	2.	3.	4.	5.	Roughing Gouge	Live/revolving Centre	Faceplate	Vernier Calipers	Parting Tool	5 x 1 mark																				
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19.	Exploded dovetail sketch... 	2 x 2 marks 1 x 1 mark																														
20.	Cutting List...  <table border="1" data-bbox="411 1261 1273 1563"> <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>200</td> <td>190</td> <td>12</td> </tr> <tr> <td>Sides</td> <td>2</td> <td>165</td> <td>126</td> <td>12</td> </tr> <tr> <td>Front/Back</td> <td>2</td> <td>245</td> <td>190</td> <td>12</td> </tr> <tr> <td>Roof</td> <td>2</td> <td>180</td> <td>200</td> <td>12</td> </tr> <tr> <td>Dowel</td> <td>1</td> <td>62</td> <td colspan="2">Ø12</td> </tr> </tbody> </table> 	Description	Quantity	Length	Width	Thickness	Base	1	200	190	12	Sides	2	165	126	12	Front/Back	2	245	190	12	Roof	2	180	200	12	Dowel	1	62	Ø12		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 (140 without curve)</i> <i>Showing overall width (250)</i> <i>Showing thickness of sides (10)</i> <i>Showing position and thickness of bottom shelf (30/10)</i> <i>Showing hidden detail for shapes in sides(4+ lines)</i> <i>Location and thickness of divider (10)</i> <i>Locating ctr and drawing back radius either side (25)</i> <i>Locating centre and drawing each curve (r50 & r70)</i> <i>Drawing line at base of curves</i></p>	<p>1 mark 1 mark 2 x 1 mark 2 x 1 mark 2 x 1 mark 2 x 1 mark 3 x 1 mark 1 mark</p>
<p>(ii)</p> 	<p>End Elevation -</p> <p><i>Setting out/transferring height (without curve)</i> <i>Setting out depth (120)</i> <i>Drawing shape of cut out</i> <i>Locating top and thickness of back</i> <i>Locating top of quadrant (r25)</i> <i>Locating centre and draw a quadrant on sides (r20)</i> <i>Showing line tangential to quadrants</i> <i>Hidden detail (4+ lines)</i></p> <p>General -</p> <p><i>Scale</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 marks 2 x 1 mark 1 mark 2 marks 1 mark 2 marks</p> <p>1 mark 4 marks</p>
<p>(iii)</p>	<p>Joining divider to front of unit ...</p> <p><i>Mortice and tenon, housed/dovetail housing</i> <i>Dowelling, Biscuit joint,</i> <i>Plugged/concealed screws</i></p> <p><i>Description/name only</i></p>	<p>5 + 2 marks</p> <p>2 marks</p>

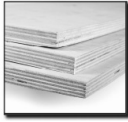
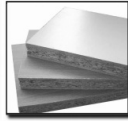

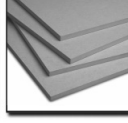
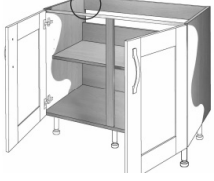
QUESTION	ANSWER	MARKS
<p>2. (i)</p>	<p>Explanation of steps in design process...</p> <p>Design Ideas/Solutions –</p> <p><i>Proposals based on the analysis of the brief and the investigation/research carried out that should meet all the requirements. One design idea or elements from several ideas can be brought together into the selected solutions</i></p> <p>Evaluation-</p> <p><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. Indication of the proposed changes if the project were to be undertaken again.</i></p>	<p>5 marks</p> <p>5 marks</p>
<p>(ii)</p> 	<p>Design solution for candle holder...</p> <p><i>Basic unit/box without any design features (sketch only)</i></p> <p><i>Fair attempt to display candles in an attractive, suitable, 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>1 mark</p> <p>↓</p> <p>10 marks</p> <p>↓</p> <p>13 marks</p> <p>↓</p> <p>16 marks</p> <p>↓</p> <p>20 marks</p>
<p>(iii)</p>	<p>Wall mounting</p> <p><i>Mirror or picture plates, predrilled batten angle brackets, screws and plugs other suitable method</i></p>	<p>2 + 2 marks</p>
<p>(iv)</p>	<p>Specific requirement ...</p> <p><i>Any relevant requirement to the design: Access, safety, appearance, function, size, shape, proportion, suitability...</i></p> <p>Incorporation of design requirements...</p> <p><i>Notes and sketches required in this section</i></p>	<p>2 marks</p> <p>2 + 2 marks</p>

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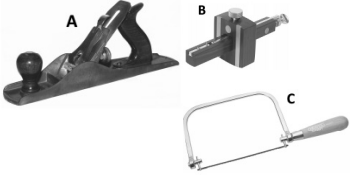
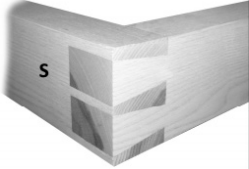
QUESTION	ANSWER	MARKS
3. (i)	Identification of manufactured boards... <i>A-Plywood</i> <i>B-Chipboard</i> <i>C-Lamwood/Pineboard</i> <i>D-MDF/HDF/LDF/Hardboard</i> <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;">  <p>A</p> </div> <div style="text-align: center;">  <p>B</p> </div> <div style="text-align: center;">  <p>C</p> </div> <div style="text-align: center;">  <p>D</p> </div> </div>	2 x 4 marks 2 x 2 marks
(ii)	Advantages of manufactured boards over solid wood... <i>Cheaper, available in large sheets, more stable, stronger, less defects, resistant to insect attack, presanded (prefinished), reduces deforestation...</i>	4 x 3 marks
(iii)	Manufacture of Plywood... <ul style="list-style-type: none"> • <i>Veneer is peeled from the log</i> • <i>Arranged in an odd number of veneers at right angles</i> • <i>Glue is placed between the veneers</i> • <i>Pressure and heat is applied</i> • <i>Boards are trimmed to size and sanded</i> • <i>Stack properly</i> 	3 + 9 marks
(iv)	Comparison of joining methods... <div style="display: flex; align-items: center;">  <div style="margin-left: 20px;"> <p><i>Dowel, biscuit, domino, screws, pocket screws, plastic block joint, chipboard inserts, angle brackets...</i></p> <p><i>Comparison</i></p> </div> </div>	3 x 1 mark (1 + 1 + 1) 1 mark

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12

12

4


QUESTION	ANSWER	MARKS
4. (i)	Names of tools... <i>A=Jack Plane</i> <i>B=Mortice / Combination Gauge</i> <i>C=Coping Saw</i> 	3 x 4 marks
(ii)	Setting the jack plane... <ul style="list-style-type: none"> • <i>Set the blade to the required depth using the adjusting wheel</i> • <i>Using the lateral adjusting lever ensure the blade is level</i> Using the jack plane... <ul style="list-style-type: none"> • <i>Secure the wood to be planed</i> • <i>Determine grain direction</i> • <i>Place the plane on the wood and move it over the wood adjusting the wheel until a sufficient shaving is cut.</i> • <i>Holding the knob and handle place the plane at the end of the piece of wood and push it firmly across the entire length, without it lifting off the surface</i> • <i>Lift the plane back to the starting position and repeat until complete</i> • <i>Feet spaced apart to achieve correct balance/stance.</i> 	2 + 2 marks 3 + 3 marks
(iii)	Setting the mortice gauge... <ul style="list-style-type: none"> • <i>Release thumb screw and loosen adjustable thumb screw</i> • <i>Set spur to chisel or rule</i> • <i>Set distance between stock and adjustable spur</i> • <i>Tighten thumb screw.</i> Using mortice gauge... <ul style="list-style-type: none"> • <i>Place stock against face side or edge</i> • <i>Put stop points at furthest line</i> • <i>Rotate spurs until engaged with timber and scribe lines.</i> 	2 + 2 marks 3 + 3 marks
(iv)	Marking out of dovetail... <ul style="list-style-type: none"> • <i>Measure and mark length of pins.</i> • <i>Square lines around the wood</i> • <i>Set mortice gauge to required width of the dovetail and mark a set of lines on one side</i> • <i>Set mortice gauge to other width of the dovetail and mark other side of piece</i> • <i>Reset the gauge to account for distance pin is from face edge and the width of the dovetail and scribe a second set of lines</i> • <i>Repeat this for the other width of the dovetail</i> • <i>Join lines across the end grain</i> • <i>Mark waste.</i> Allow for <i>Sliding Bevel/Template</i> Removing the waste... <ul style="list-style-type: none"> • <i>Secure wood in a vice</i> • <i>Saw vertically a distance between 5-10 mm on all lines</i> • <i>Tilt the piece at an angle of 45° and saw down each line keeping the saw below the opposite corner</i> • <i>Rotate the piece in that position and repeat the sawing.</i> • <i>Position the piece vertically in the vice and saw as far as the inside line</i> • <i>Using a coping saw/mallet and chisel remove the waste.</i> • <i>Pare remaining waste back to the inside line.</i> 	3 + 1 mark 3 + 1 mark

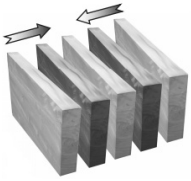
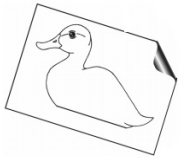

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QUESTION	ANSWER	MARKS	
5A. (i)	<p>Laminating...</p> <ul style="list-style-type: none"> • <i>Prepare formwork to the specified shape</i> • <i>Cut laminates to width and thickness</i> • <i>Dry clamp laminates in the formwork</i> • <i>Steam if required</i> • <i>Apply glue to laminates</i> • <i>Place in formwork</i> • <i>Apply pressure using clamps</i> • <i>Leave for 24hrs to set</i> • <i>Remove clamps and formwork</i> • <i>Plane edges and cut to size</i> • <i>Prepare and apply a suitable finish</i> 	 <p>4 + 8 marks</p>	12
(ii)	<p>Producing the spindle...</p> <ul style="list-style-type: none"> • <i>Draw the diagonals on both ends of piece to locate centre.</i> • <i>Place in vice and plane down the corners to octagonal shape</i> • <i>Punch hole in centre of timber to receive drive centre</i> • <i>Remove drive centre from lathe and insert into timber using a mallet.</i> • <i>Adjust tailstock to take length of timber</i> • <i>Replace drive centre into headstock and attach timber.</i> • <i>Tighten live centre, using handwheel, and lock into place</i> • <i>Adjust toolrest to appropriate height and position</i> • <i>Turn spindle by hand to ensure free movement</i> • <i>Turn on lathe and use the roughing gouge to round the wood</i> • <i>Mark design with pencil on the wood</i> • <i>Apply skew chisel, finger gouges and scrapers to shape timber</i> • <i>Sand the spindle and finish using required finish.</i> 	<p>4 + 8 marks</p>	12
(iii)	<p>Method of making an identical spindle...</p> <ul style="list-style-type: none"> • <i>Rule and callipers...measuring critical points...mark lines on the spindle...use callipers for diameter</i> • <i>Using a profile template check work repeatedly as you proceed ...marking out and cutting of profile...applying to workpiece</i> • <i>Use of a contour gauge...setting gauge...applying to spindle</i> • <i>Using a copying lathe...setting up...basic knowledge of copying lathe or copying attachment displayed.</i> 	<p>2 + 4 marks</p>	6
(iv)	<p>Preparation for varnish finish...</p> <ul style="list-style-type: none"> • <i>Use suitable scraper to remove pencil marks or scratches</i> • <i>Raise bruises or dents by sweating with heat and steam</i> • <i>Fill any holes or imperfections</i> • <i>Sand using abrasive paper, moving from coarse to fine</i> • <i>Dust down surfaces</i> • <i>Wipe surface with a damp cloth and cut back using a very fine paper or steel wool when dry</i> • <i>Wipe down with white spirits.</i> <p>Applying a clear finish...</p> <ul style="list-style-type: none"> • <i>Apply the first coat using a suitable cloth/brush...</i> • <i>Allow finish to dry</i> • <i>Sand lightly between coats</i> • <i>Apply 2nd and subsequent coats sanding lightly between coats</i> 	<p>5 marks</p> <p>5 marks</p>	10

QUESTION	ANSWER	MARKS
<p>5B. (i)</p> 	<p>Making the large block...</p> <ul style="list-style-type: none"> • <i>Apply a film of suitable glue between the pieces</i> • <i>Align the wooden blocks together accurately</i> • <i>Apply pressure using clamps or vice</i> • <i>Allow glue sufficient time to set</i> • <i>Remove from clamps.</i> 	<p>3 + 6 marks</p>
<p>(ii)</p> 	<p>Transferring duck outline to wood ...</p> <ul style="list-style-type: none"> • <i>Tape the drawing to one side 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>3 + 6 marks</p>
<p>(iii)</p>	<p>Carving the duck outline...</p> <ul style="list-style-type: none"> • <i>Cut the rough shape of the outline using a bandsaw</i> • <i>Tape the waste back in place and cut the plan outline of the duck</i> • <i>Using a gouge and mallet rough out the shape</i> • <i>Carve the finer details using finer carving tools and chisels</i> • <i>Use rasps to soften the outline</i> • <i>Sand and apply a finish.</i> 	<p>6 + 6 marks</p>
<p>(iv)</p> 	<p>Preparation for varnish finish...</p> <ul style="list-style-type: none"> • <i>Use suitable scraper to remove pencil marks or scratches</i> • <i>Raise bruises or dents by sweating with heat and steam</i> • <i>Fill any holes or imperfections</i> • <i>Sand using abrasive paper, moving from coarse to fine</i> • <i>Dust down surfaces</i> • <i>Wipe surface with a damp cloth and cut back using a very fine paper or steel wool when dry</i> • <i>Wipe down with white spirits.</i> <p>Application of the finish...</p> <ul style="list-style-type: none"> • <i>Apply one coat using a brush (for varnish and oil) a cloth (for varnish, oil and wax), or wire wool or wax stick (for wax)</i> • <i>Cut back and apply second and subsequent coat for varnish and lacquer. Apply second subsequent coat and buff for wax</i> • <i>Lacquer should be applied by brushing or spraying in a ventilated area.</i> 	<p>5 marks</p> <p>5 marks</p>

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