



Coimisiún na Scrúduithe Stáit
State Examinations Commission

Junior Certificate 2012

Marking Scheme

Materials Technology Wood

Higher Level



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State Examinations Commission




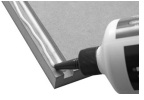



Junior Certificate Examination 2012

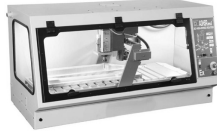






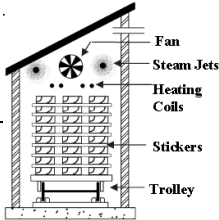

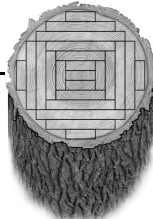
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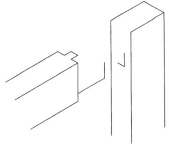


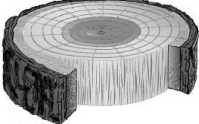
*The Sample solutions shown are presented as example answers.
All other valid solutions are acceptable and are marked
accordingly.*

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... Jig Saw	 3 marks																		
(ii)	Specific use of jig saw... Sawing / Cutting: curves, angles, timber ...	2 marks																		
2. (i)	Distortion... Cupping	 3 marks																		
(ii)	Reason... Shrinkage, poor stacking, tangential conversion mix of heartwood and sapwood, poor seasoning...	2 marks																		
3.	Force... Torsion	 5 marks																		
4.	Glue... Poly Vinyl Acetate	 2x2 marks 1x1 mark																		
5.	Aesthetics... Appreciation of beauty, good design, fine appearance, good proportion...	 5 marks																		
6. (i)	Saws... <table border="1" style="margin-left: auto; margin-right: auto; border-collapse: collapse;"> <thead> <tr style="background-color: black; color: white;"> <th>Saws</th> <th>Forward stroke</th> <th>Return stroke</th> </tr> </thead> <tbody> <tr> <td>Tenon Saw</td> <td style="text-align: center;">✓</td> <td></td> </tr> <tr> <td>Coping Saw</td> <td></td> <td style="text-align: center;">✓</td> </tr> <tr> <td>Panel Saw</td> <td style="text-align: center;">✓</td> <td></td> </tr> <tr> <td>Rip Saw</td> <td style="text-align: center;">✓</td> <td></td> </tr> <tr> <td>Hacksaw</td> <td style="text-align: center;">✓</td> <td></td> </tr> </tbody> </table>	Saws	Forward stroke	Return stroke	Tenon Saw	✓		Coping Saw		✓	Panel Saw	✓		Rip Saw	✓		Hacksaw	✓		 5x1 marks
Saws	Forward stroke	Return stroke																		
Tenon Saw	✓																			
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7. (i)	Woodwork tool... Nail Punch Punch	 3 marks 1 mark																		
(ii)	Use... To punch nails below the surface for filling Decorate carving	2 marks																		

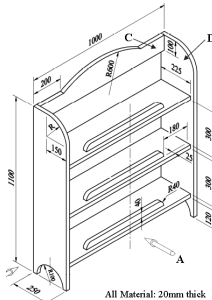
8.	<p>Two reasons for using a CNC router...</p> <p><i>To groove, rebate, mould, add designs, carve...</i> <i>Because it is: fast, safe, accurate, able to reproduce designs...</i></p> 	<p>3 marks 2 marks</p>																		
9.	<p>Microporous finishes...</p> <p><i>Protect the wood from water while allowing any moisture in the wood to evaporate. Water resistant</i></p> 	5 marks																		
10.	<p>Tree identification...</p> <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;">  Sycamore/Maple </div> <div style="text-align: center;">  Horse Chestnut </div> <div style="text-align: center;">  Ash </div> </div>	<p>2x2 marks 1x1 mark</p>																		
11.	<p>(i) Plane...</p> <p>Block/Palm Plane</p> 	3 marks																		
	<p>(ii) Appropriate use...</p> <p><i>Forming chamfers, planing endgrain, smoothing timber...</i></p>	2 marks																		
12.	<p>(i) Power tool...</p> <p>Biscuit joiner / Domino joiner</p> 	3 marks																		
	<p>(ii) Appropriate use...</p> <p>Making joints in wood</p>	2 marks																		
13.	<p>(i) Method of seasoning...</p> <p>Kiln/Artificial Seasoning</p> 	3 marks																		
	<p>(ii) Function of stickers...</p> <p><i>To support the planks and allow air to circulate</i></p>	2 marks																		
14.	<p>Plastics...</p>  <table border="1"> <thead> <tr> <th>Plastics</th> <th>Thermosetting</th> <th>Thermoplastic</th> </tr> </thead> <tbody> <tr> <td>Acrylic</td> <td></td> <td>✓</td> </tr> <tr> <td>Polystyrene</td> <td></td> <td>✓</td> </tr> <tr> <td>Epoxy Resin</td> <td>✓</td> <td></td> </tr> <tr> <td>Nylon</td> <td></td> <td>✓</td> </tr> <tr> <td>Polythene</td> <td></td> <td>✓</td> </tr> </tbody> </table>	Plastics	Thermosetting	Thermoplastic	Acrylic		✓	Polystyrene		✓	Epoxy Resin	✓		Nylon		✓	Polythene		✓	5 x 1 mark
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Acrylic		✓																		
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15.	<p>(i) Name of conversion...</p> <p>Tangential</p> 	3 marks																		
	<p>(ii) Advantage...</p> <p><i>Separates sapwood and heartwood, stronger boards, figure and flame grain, takes nails better</i></p>	2 marks																		


16.	Reasons to apply a finish ... <i>Improve appearance, resist moisture , prevent decay, change colour, protect easy to clean ...</i>		3 marks 2 marks																														
17.	Sketch of Haunched Mortice and joint... <i>Tenon Mortice</i>		3 marks 2 marks																														
18. (i)	Woodworking machine... <i>Bandsaw</i>		2 marks																														
(ii)	<i>A = Guard B = Fence C = Blade/Teeth</i>		3 x 1 mark																														
19. (i)	Cross section of tree... <i>Bast, phloem, inner bark, cambium layer, xylem.</i>		3 marks																														
(ii)	<i>Transport, growth (reproducing cells)</i>		2 marks																														
20.	Cutting list... <table border="1"> <thead> <tr> <th>Description</th> <th>Quantity</th> <th>Length</th> <th>Width</th> <th>Thickness</th> </tr> </thead> <tbody> <tr> <td>Body</td> <td>1</td> <td>300</td> <td>50</td> <td>20</td> </tr> <tr> <td>Wings</td> <td>2</td> <td>240</td> <td>70</td> <td>12</td> </tr> <tr> <td>Tail</td> <td>1</td> <td>100</td> <td>30</td> <td>12</td> </tr> <tr> <td>Fin</td> <td>1</td> <td>30</td> <td>25</td> <td>12</td> </tr> <tr> <td>Dowels</td> <td>4</td> <td>62</td> <td colspan="2">Ø6</td> </tr> </tbody> </table>	Description	Quantity	Length	Width	Thickness	Body	1	300	50	20	Wings	2	240	70	12	Tail	1	100	30	12	Fin	1	30	25	12	Dowels	4	62	Ø6			5 x 1 mark
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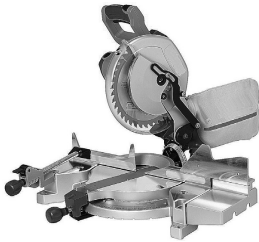


Running total of allowed questions for this section to be recorded and shown as indicated at the marking conference.

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)	<p>Preparation of working drawing ...</p> <p>Elevation -</p> <p><i>Setting out overall length (1000)</i> <i>Showing overall height (1100)</i> <i>Showing thickness of sides (20)</i> <i>Showing width of top rail (100)</i> <i>Showing position and thickness of any shelf (20)</i> <i>Showing position and width of any shelf stops (40)</i> <i>Finding centre for curve</i> <i>Drawing curve</i> <i>Drawing any shelf stop fillet</i></p> <p>End view -</p> <p><i>Setting out/transferring overall height</i> <i>Setting out width (250)</i> <i>Showing position and width of shelves (20)</i> <i>Showing position and thickness of shelf stop(20)</i> <i>Drawing fillet (150)</i> <i>Showing position and thickness of back rail</i> <i>Drawing semi circle (100)</i></p> <p>General -</p> <p><i>Hidden detail (any line)</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 1 mark 2 x 1 mark 2 x 1 mark 2 marks 1 mark 2 marks</p> <p>1 mark 1 mark 3 x 2 marks 3 x 1 mark 1 mark 2 x 1 mark 1 mark</p> <p>1 mark 1 mark 1 mark 2 marks</p>	<p>14</p> <p>15</p> <p>5</p>
(ii)	<p>Method of jointing C to D...</p> <p><i>Dovetail</i> <i>Finger</i> <i>Lap Halving joint</i> <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>4 + 2 marks</p> <p>2 marks</p>	6

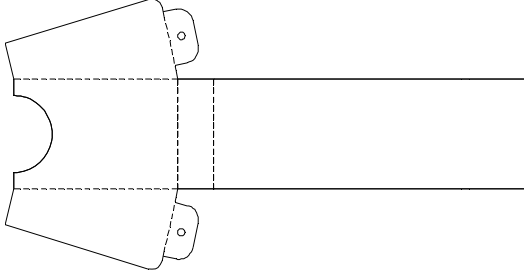
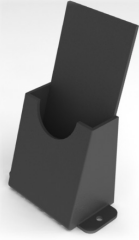
QUESTION	ANSWER	MARKS	
3. (i)	Manufactured boards...  <p>A= Plywood. B= Chipboard/Oriented Strand Board C= Lamwood /Pineboard/Laminated Pine</p>	3 x 4 marks	12
(ii)	Advantages ... <p><i>More stable, wider boards, cheaper, uniform thickness, conserve expensive timbers, fewer defects, reduce deforestation, immune to insect attack...</i></p>	4 x 2 marks	8
(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> Manufacture of Chipboard... <ul style="list-style-type: none"> • <i>Waste timber is shredded and dried</i> • <i>Chips are mixed with an adhesive</i> • <i>Mixture is pressed and heated into board form</i> • <i>Boards are trimmed to size and sanded when dry</i> Manufacture of Lamwood... <ul style="list-style-type: none"> • <i>Strips of timber are sawn and planed to uniform width and thickness</i> • <i>Glue is placed between the strips</i> • <i>Pressure is applied until the glue sets</i> • <i>Boards are trimmed to size and sanded</i> 	4x2+4 marks	12
(iv)	Reasons why tropical rainforests should be conserved ... <p><i>Protection of habitats, reduction of CO₂ levels, aesthetics, rare flora/fauna, prevent silting of watercourses, prevent soil erosion, renewable supply of hardwoods accept political answer...</i></p> Use of manufactured boards to reduce deforestation ... <p><i>Reduce need for tropical hardwoods, Providing an alternative to solid wood By using wood from managed forests, thinnings and waste/recycled timber. By using veneers to give the effect of real wood Manufactured boards use mostly softwoods...</i></p>	2 x 2 marks 2 x 2 marks	8

QUESTION	ANSWER	MARKS
4. (i)	<p>Correct names for power tools...</p> <p><i>X = Cordless/Battery Operated Drill</i> <i>Y = Router</i> <i>Z = Chopsaw/Mitre Saw/Crosscut Saw</i></p> 	3 x 4 marks
(ii) (a)	<p>Explanation...</p> <p><i>A chuck which can be tightened or loosened manually without a key</i></p> <p>Advantages of keyless chuck...</p> <p><i>Safer</i> <i>Quicker to loosen and tighten</i> <i>Easier and more convenient</i> <i>Does not require a chuck key</i></p> 	3 marks 2 x 3 marks
(b)	<p>Making holes to a required depth...</p> <p><i>Depth stop/Tape: Attach a depth stop/tape to drill bit at required depth and stop boring when depth stop/tape touches the surface of the timber</i></p>	3+4 marks
(iii)	<p>Safety precautions when using a router...</p> <p><i>Ear protection - To prevent hearing loss</i> <i>Eye protection - To prevent damage to eyes</i> <i>Dust extraction - To clear harmful dust from work area</i> <i>Secure workpiece - Prevents accidental injury</i> <i>No loose clothing - may entangle in machine and cause injury</i> <i>Tighten all clamps and locking device-prevent slippage</i> <i>Tight grip on the router</i> <i>Ensure bit is not in contact with work when starting</i> <i>Switch off at the wall socket before making adjustments...</i></p> 	3 x 2marks 3 x 2marks

12

16

12

QUESTION	ANSWER	MARKS
5(A). (i)	Development of holder... <i>Surfaces(7)</i> <i>Fold Lines(3/6)</i> <i>Fillets(2/4)</i> <i>Semi circle</i> <i>Quality of Drawing</i> 	7 x 1 mark 3 x 1mark 2 x 1 mark 1 x 1 mark 2 marks
(ii)	Machine... <i>Strip Heater</i> 	4 marks
(iii)	Bending acrylic... <ul style="list-style-type: none"> • <i>Cut former to required angle</i> • <i>Switch on strip heater</i> • <i>Place acrylic on strip heater</i> • <i>Align line with heating element</i> • <i>Place acrylic on former, or folding plate and hold in position</i> • <i>Allow to cool</i> 	3 x 2 + 6 marks
(iv)	Three safety precautions... <i>Wear face goggles, tie up hair, no loose clothing, remove jewellery, secure drill bit, remove chuck key, place acrylic on waste piece of timber, select slow feed, secure work before commencing...</i>	3 x 3marks

15

4

12

9

QUESTION	ANSWER	MARKS	
5(B). (i)	Transferring design to wood ... <ul style="list-style-type: none"> • <i>Tape the 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> 	3 x 2 + 4 marks	10
(ii)	Cutting the veneers ... <ul style="list-style-type: none"> • <i>Apply tape to reinforce</i> • <i>Cut the design accurately in a veneer</i> • <i>Place this veneer over selected coloured veneers, ensuring grain is in right direction and cut shape accurately through the gap/window</i> • <i>Tape the cut piece onto the gap</i> • <i>Cut subsequent shapes in the same way and build up the picture fitting and taping pieces in place as you progress</i> • <i>Apply tape to reinforce</i> • <i>Place two veneers together and cut design accurately through both</i> • <i>Swap shapes and tape together</i> • <i>Repeat for subsequent shapes and build up the picture fitting and taping pieces as you progress</i> 	4 x 2 + 4 marks	
(iii)	Glue... <i>Animal Glue, Impact/Contact Adhesive, Synthetic Resin, Casein glue, PVA</i>	3 marks	6
	Reason... <i>Strong bond, easy to clean, non staining ease of application, adjustable, instant grip...</i>	3 marks	
(iv)	Name... <i>Rotary Half Round Flat Slicing</i>	3 marks	12
	Manufacture of veneers ... <i>Log is debarked and softened</i> <p>Rotary: <i>Placed on a giant lathe</i> <i>The log is rotated and a continuous veneer is peeled from the log</i></p> <p>Half Round: <i>Log is split in two</i> <i>The half log is placed off centre on a giant lathe and rotated against a knife</i> <i>Thin sheets are peeled from the log</i></p> <p>Flat Slicing <i>Log is split or cut square</i> <i>Placed on a sliding frame</i> <i>The frame is moved across the knife blade</i> <i>Thin slices of veneer are removed</i></p>	3 + 6marks	

