



Coimisiún na Scrúduithe Stáit
State Examinations Commission

Junior Certificate Examination 2009


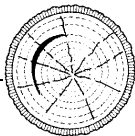

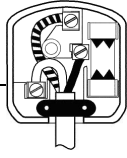





Materials Technology Wood




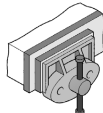
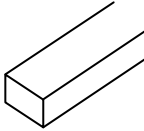


Higher Level



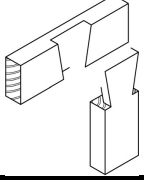
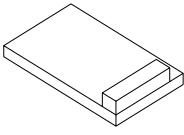

Marking Scheme

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>Claw Hammer</i> <i>Hammer</i>	 3 marks 1 mark
(ii)	Specific function of Part A... <i>Levering/Extracting nails</i>	2 marks
2. (i)	Name of defect... <i>Cup shake</i> <i>Shake</i>	 1x 3 marks 1 mark
(ii)	Most common cause... <i>Poor felling, strong winds, old age, poor nutrition</i>	1 x 2 mark
3.	Name of moulding... <i>(Stopped) Chamfer</i>	 5 marks
4. (i)	Plug terminals... <i>S=Earth</i> <i>T=Neutral</i>	 1x2 marks 1x1 mark
(ii)	Function of fuse... <i>A safety device to break circuit in case of short circuit or overloading</i>	2 marks
5.	Three common Irish trees...    <i>Oak</i> <i>Horse Chestnut</i> <i>Beech</i>	2x2 marks 1x1 marks
6. (i)	Woodworking tool... <i>Gouge Chisel</i>	 1x3 marks
(ii)	Use of gouge... <i>Carving/shaping wood lathework</i>	1x2 marks
7 (i)	Categories of plastics... Category 1 <i>Thermosetting</i> Category 2 <i>Thermoplastic</i>	 2 x 2 marks
(ii)	Remouldable plastic... <i>Thermoplastic</i>	1 x 1 mark

8.	(i)	Two applied finishes ... <i>Varnish, Paint, Danish Oil, Teak Oil, Tung Oil, Lacquer</i>	 1 x 2 marks 1 x 1 mark																		
	(ii)	Reason finishes are suitable... <i>Protects, Enhances, Preserves, Looks well...</i>	1 x 2 marks																		
9.	(i)	Feature... <i>Set</i>	 3 marks																		
	(ii)	Reason for set... <i>To allow clearance for the blade</i>	 2 marks																		
10.		Correct name for force applied... <i>Compression</i>	 5 marks																		
11.		Identity of metals... <table border="1" data-bbox="357 786 1209 1061"> <thead> <tr> <th>Metals</th> <th>Ferrous</th> <th>Non Ferrous</th> </tr> </thead> <tbody> <tr> <td>Brass</td> <td></td> <td>✓</td> </tr> <tr> <td>Copper</td> <td></td> <td>✓</td> </tr> <tr> <td>Steel</td> <td>✓</td> <td></td> </tr> <tr> <td>Zinc</td> <td></td> <td>✓</td> </tr> <tr> <td>Cast Iron</td> <td>✓</td> <td></td> </tr> </tbody> </table>	Metals	Ferrous	Non Ferrous	Brass		✓	Copper		✓	Steel	✓		Zinc		✓	Cast Iron	✓		5 x 1 marks
Metals	Ferrous	Non Ferrous																			
Brass		✓																			
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12.		Three safety features in M.T.W. workshop... <i>Knock out switches, 110V supply, Machine guards, Safety signs, Circuit breakers, Fused plugs, Dust extractor, PPE....</i>	2 x 2 marks 1 x 1mark																		
13.	(i)	Grain and shading... <i>Any side grain</i> <i>End grain</i> <i>Shading</i>	 1 mark 1 mark 1 mark																		
	(ii)	Face side and face edge ... <i>Face side</i> <i>Face edge</i>	1 mark 1 mark																		
14.	(i)	Woodturning equipment...  <i>Face guard/ shield/visor</i>	 <i>Faceplate</i> 1 x 2 marks 1 x 1 mark																		
	(ii)	Precaution... <i>Wear goggles/visor, dust mask, use appropriate speed, tie up long hair, remove jewellery, secure work piece, rotate work piece before switching on....</i>	2 marks																		

15.	Two advantages of a CNC... <i>Greater accuracy, faster, mass production, automatic...</i>		3 marks 2 marks																								
16. (i)	Type of hinge... <i>Butt hinge</i>		1 x 3 marks																								
(ii)	Use... <i>Doors, box lids, cabinets.</i>		1 x 2 marks																								
17.	Completed sketch of Tee Halving Joint ... <i>Trench part</i> <i>Dovetail part</i>		3 marks 2 marks																								
18.	3D sketch of bench hook... <i>Reasonable sketch</i>		5 marks																								
19. (i)	Design defect... <i>Unsupported shelves, unstable structure, open back and ends...</i>		3 marks																								
(ii)	Remedy ... <i>Support shelves, attach back, ends...</i>		2 marks																								
20.	Cutting list... <table border="1" data-bbox="399 1377 1165 1601"> <thead> <tr> <th>Description</th> <th>Qty</th> <th>Length</th> <th>Width</th> <th>Thickness</th> </tr> </thead> <tbody> <tr> <td>Base</td> <td>1</td> <td>300</td> <td>100</td> <td>15</td> </tr> <tr> <td>Sides</td> <td>2</td> <td>150</td> <td>100</td> <td>15</td> </tr> <tr> <td>Back rail</td> <td>1</td> <td>300</td> <td>30</td> <td>15</td> </tr> <tr> <td>Front rail</td> <td>1</td> <td>180</td> <td>30</td> <td>15</td> </tr> </tbody> </table>	Description	Qty	Length	Width	Thickness	Base	1	300	100	15	Sides	2	150	100	15	Back rail	1	300	30	15	Front rail	1	180	30	15	5 x 1 mark
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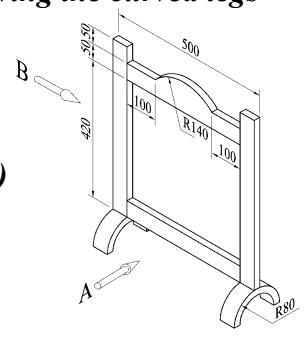
Running total of allowed questions for this section to be recorded and shown as indicated at the marking conference.


Notes:



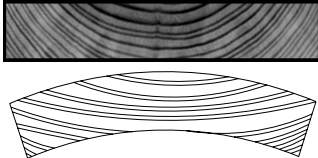
SECTION B

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 style="padding-left: 40px;"><i>Setting out overall width (500)</i></p> <p style="padding-left: 40px;"><i>Showing overall height (600)</i></p> <p style="padding-left: 40px;"><i>Showing width of stiles (50)</i></p> <p style="padding-left: 40px;"><i>Showing position and width of top rail</i></p> <p style="padding-left: 40px;"><i>Showing position and width of bottom rail</i></p> <p style="padding-left: 40px;"><i>Showing position and width of leg</i></p> <p style="padding-left: 40px;"><i>Finding the centre and drawing the curve to the top rail</i></p> <p>End view -</p> <p style="padding-left: 40px;"><i>Setting out/transferring overall height</i></p> <p style="padding-left: 40px;"><i>Setting out to width (160)</i></p> <p style="padding-left: 40px;"><i>Showing thickness of stiles (20)</i></p> <p style="padding-left: 40px;"><i>Finding the centre and drawing the curved legs</i></p> <p>General -</p> <p style="padding-left: 40px;"><i>Hidden detail (any 2 lines)</i></p> <p style="padding-left: 40px;"><i>Scale</i></p> <p style="padding-left: 40px;"><i>Dimensions (any 4)</i></p> <p style="padding-left: 40px;"><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 scheme 	<p>2 marks</p> <p>2 marks</p> <p>2 x 1 mark</p> <p>2 x 1 marks</p> <p>2 x 1marks</p> <p>2 x 1 marks</p> <p>2 x 1 mark</p> <p>2 mark</p> <p>2 marks</p> <p>2 marks</p> <p>3 x 1 mark</p> <p>1 marks</p> <p>4 marks</p> <p>2 marks</p> <p>3 marks</p>	<p>14</p> <p>9</p> <p>10</p>
(ii)	<p>Method of inserting wooden panel...</p> <p style="padding-left: 40px;"><i>Forming a groove or rebate to accommodate panel</i></p> <p style="padding-left: 40px;"><i>Using dowels, dominoes, biscuits or spindles</i></p> <p style="padding-left: 40px;"><i>Metal brackets</i></p> <p style="padding-left: 40px;"><i>Form a groove or rebate using slips of timber</i></p> <p style="padding-left: 40px;"><i>Description/name only</i></p>	<p>5 + 2 marks</p> <p>2 marks</p>	<p>7</p>



QUESTION	ANSWER	MARKS	
2. (i)	<p>Explanation of steps in design process...</p> <p>Investigation/Research -</p> <p><i>The process wherein you look at the problem, identify key requirements for the design solution and gather information that will allow you to arrive at possible design solutions. Looking for ideas, studying similar artefacts, etc.</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>	10
(ii)	<p>Design solution for display of awards...</p> <p><i>Basic unit/box without any design features (sketch only)</i></p> <p><i>Fair attempt to display items in an attractive, compact unit. (Must include notes)</i></p> <p><i>Good, well balanced, well sketched design, showing some innovation.</i></p>	<p>5 marks</p> <p>↓</p> <p>10 marks</p> <p>↓</p> <p>15 marks</p>	15
(iii)	<p>Two specific design requirements ...</p> <p><i>Any two relevant requirements to the design</i></p> <p><i>Access, safety, appearance, function, stability, size, shape, proportion, suitability...</i></p>	<p>2 x 3 marks</p>	6
(iv)	<p>Suitable material for the manufacture of the unit ...</p> <p><i>Mark for any suitable named material (Including manufactured boards)</i></p> <p>Reasons ...</p> <p><i>Reasons appropriate to selected material : Cost, appearance, workability, durability, finish...</i></p>	<p>3 marks</p> <p>2 x 3 marks</p>	9



QUESTION	ANSWER	MARKS									
3. (i)	<p>Methods of conversion...</p> <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;">  <p><i>Through and through, plain or slash sawing</i></p> </div> <div style="text-align: center;">  <p><i>Tangential sawing</i></p> </div> </div>	<p>4 marks 4 marks</p>									
(ii)	<p>Advantages/Disadvantages of conversion methods ...</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 15%;"></th> <th style="width: 40%;">ADVANTAGES</th> <th style="width: 45%;">DISADVANTAGES</th> </tr> </thead> <tbody> <tr> <td style="text-align: center; vertical-align: middle;">SLASH SAWING</td> <td> <i>Fast, easy to set up and manipulate. Very little waste produced Wide boards Cheaper</i> </td> <td> <i>Boards prone to cupping and warping Lot of sapwood in outer boards, prone to fungal and insect attack</i> </td> </tr> <tr> <td style="text-align: center; vertical-align: middle;">TANGENTIAL SAWING</td> <td> <i>Stable boards produced, Good strength Boards dry quickly Attractive grain Separates heartwood and sapwood</i> </td> <td> <i>More manipulation of the log required More waste produced Smaller boards Boards prone to cupping and warping More expensive</i> </td> </tr> </tbody> </table>		ADVANTAGES	DISADVANTAGES	SLASH SAWING	<i>Fast, easy to set up and manipulate. Very little waste produced Wide boards Cheaper</i>	<i>Boards prone to cupping and warping Lot of sapwood in outer boards, prone to fungal and insect attack</i>	TANGENTIAL SAWING	<i>Stable boards produced, Good strength Boards dry quickly Attractive grain Separates heartwood and sapwood</i>	<i>More manipulation of the log required More waste produced Smaller boards Boards prone to cupping and warping More expensive</i>	<p>8 x 2 marks</p>
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(iii)	<p>Direction of cupping...</p> <div style="text-align: center;">  </div> <p><i>Edges curve downwards as annual rings <u>shrink</u> and tend to straighten during drying</i></p>	<p>6 marks 2 marks</p>									
(iv)	<p>Reasons why tropical rainforests should be conserved ...</p> <p><i>Protection of habitats, indigenous tribes, reduction of CO₂ levels, aesthetics, rare flora/fauna, prevent silting of watercourses ...</i></p> <p>Approaches to the conservation of rain forests ...</p> <p><i>Use of softwoods, replanting of trees cut down, use hardwood veneers not solid timber, use of managed forests ...</i></p>	<p>2 x 2 marks 2 x 2 marks</p>									

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16

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QUESTION	ANSWER	MARKS
4 (A). (i)	<p>Method of forming holes in blanket box...</p>  <ul style="list-style-type: none"> • <i>Mark position and size of hole in box, using template or compass etc</i> • <i>Mark centres for curved ends</i> • <i>Using appropriate drill bit or hole saw, drill hole at each end of handle</i> • <i>Saw lines joining holes using a curve cutting saw, (pad, compass, coping, bow, fret, scroll, or jig saw)</i> • <i>Sand/router edges to finish</i> 	<p>3 x 3 marks</p> <p>5 marks</p>
(ii)	<p>Preparing blanket box for a finish...</p> <ul style="list-style-type: none"> • <i>Punch any nails or pins below the surface</i> • <i>Use smoothing plane or 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>3 x 3 marks</p>
(iii)	<p>Suitable clear applied finish...</p> <p style="text-align: center;"><i>Varnish, oils, lacquer, French polish, wax</i></p> <p>Reasons...</p> <p style="text-align: center;"><i>Protects wood, makes wood easier to clean, enhances wood, quick drying, easy to apply, durable, non toxic...</i></p>	<p>4 marks</p> <p>2 x 2marks</p>
(iv)	<p>Method of concealing recessed screws...</p> <p><i>Using dowels: select correct diameter, cut to length, apply glue, insert in recess, pare off level with surface</i></p> <p><i>Using plugs: cut plugs using appropriate sized plug cutter, remove plug from wood, apply glue, inserting in recess with grain in line with existing grain, pare plug level with surface</i></p> <p><i>Using buttons: set up spindle on lathe, turn to correct diameter, sand on lathe, cut to size, apply glue and insert in recess</i></p>	<p>3 + 6 marks</p>

14

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QUESTION	ANSWER	MARKS
4 (B). (i)	<p>Marking out and cutting of veneers...</p> <ul style="list-style-type: none"> • <i>Prepare back of veneer with masking tape</i> • <i>Arrange veneer ensuring grain is in correct direction</i> • <i>Trim end of veneer with scalpel or very sharp knife to ensure a straight edge...</i> • <i>...measure width required for diamond or triangle shape and score with scalpel at both edges</i> • <i>Place straight edge at mark and cut parallel strips with scalpel</i> • <i>Measure, width of each diamond, or triangle and cut accordingly</i> • <i>...using a jig and spacers place end of veneer in jig</i> • <i>Use appropriate spacer to locate straight edge away from end</i> • <i>Cut veneer using straight edge and scalpel</i> • <i>Measure, width of each diamond, or triangle and cut accordingly</i> 	<p>6 + 2 marks</p> <p>6 + 2 marks</p>
(ii)	<p>Application of veneers...</p> <ul style="list-style-type: none"> • <i>Using tape on one side only, fit required shape together</i> • <i>Roughen top of box and fill any holes</i> • <i>Apply glue to both surfaces</i> • <i>Fix veneer to lid.</i> • <i>Squeeze out excess glue using roller or veneer hammer or veneer press</i> • <i>Trim edges</i> 	<p>8 marks</p>
(iii)	<p>Three types of adhesive...</p> <ul style="list-style-type: none"> • <i>Animal/Scotch glue</i> • <i>Urea formaldehyde</i> • <i>Impact/contact glue</i> • <i>Heat sensitive glue film</i> • <i>PVA</i> 	<p>3 x 3 marks</p>
(iv)	<p>Rotary cutting of veneers...</p> <ul style="list-style-type: none"> • <i>Log is debarked and cut to length</i> • <i>It is softened using steam or boiling water</i> • <i>Mounted on a giant lathe and rotated against a knife</i> • <i>Veneer is peeled from the log</i> 	<p>4 + 3 marks</p>

16

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QUESTION	ANSWER	MARKS	
5. (i)	<p>Correct names for saws ...</p> <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;">  <p><i>A - Jig saw</i></p> </div> <div style="text-align: center;">  <p><i>B - Band saw</i></p> </div> <div style="text-align: center;">  <p><i>C - Scroll/Fret saw</i></p> </div> </div>	<p>4 marks 4 marks 4 marks</p>	12
(ii)	<p>Use of saws...</p> <ol style="list-style-type: none"> 1. Jig saw: <i>for making straight, curved or angled cuts in wood plastic and soft metals. Cutting out internal shapes</i> 2. Band saw: <i>Cuts curves, straight lines or angled cuts in wood, metal and plastic. Used to plank timber</i> 3. Scroll saw: <i>For cutting intricate shapes in wood, plastics and soft metals. Cutting out internal shapes</i> 	<p>4 + 1 marks 4 + 1 marks</p>	10
(iii)	<p>Safety precaution for jig saw...</p> <ul style="list-style-type: none"> • <i>Wear goggles: to protect eyes from flying debris</i> • <i>Wear ear protection: to prevent hearing loss</i> • <i>Secure work piece: to ensure it is stable while sawing preventing possible injury or breakage.</i> • <i>Allow sufficient space for blade underneath the work piece: preventing blade from breaking or damage to surfaces</i> • <i>Do not cut material thicker than blade: preventing damage to blade and ensuring proper working of machine.</i> • <i>Never place fingers near blade: preventing injury</i> • <i>Take care not to cut flex: avoiding electrocution or electric shock.</i> • <i>Disconnect tool before adjusting: avoiding injury</i> 	<p>3 x 2 marks 3 x 2 marks</p>	12
(iv)	<p>Function of X table clamping screw...</p> <p style="text-align: center;"><i>This allows the saw table to be tilted and fixed at various angles</i></p> <div style="text-align: center;">  </div>	<p>4 + 2 marks</p>	6