













Junior Certificate Examination 2010

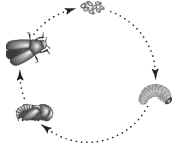



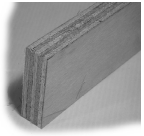


Materials Technology Wood
Higher Level
Draft Marking Scheme

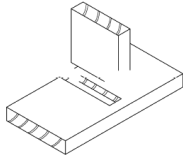
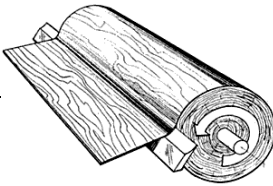
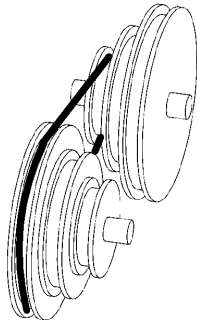
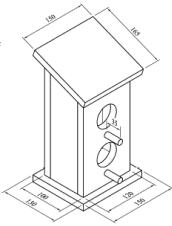
*The sample solutions shown are presented as example answers.
All other valid solutions are acceptable and are marked accordingly.*

SECTION A


Mark the best 16 answers. Disallow marks for any questions/parts of questions in excess of 16 as per Instructions to Assistant Examiners.

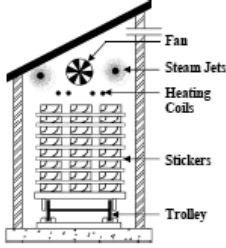
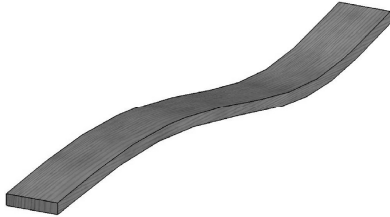
QUESTION	ANSWER	MARKS																		
1.	(i) Correct name for the tool... <i>Marking Gauge</i> <i>Gauge</i>	 3 marks 1 mark																		
	(ii) Specific use... <i>Marking a line parallel to an edge, marking joints.</i>	2 marks																		
2.	Three common Irish trees...    <i>Birch (or similar)</i> <i>Oak</i> <i>Beech</i>	2x2 marks 1x1 marks																		
3.	(i) Name of force acting on blade... <i>Tension</i>	 5 marks																		
4.	Conditions for photosynthesis... <i>CO₂, Sap (water&minerals), Chlorophyll, Sunlight</i>	2x2 marks 1x1 marks																		
5.	Parts of tree section... <i>A=Sapwood</i> <i>B=Heartwood</i>	 1x3 marks 1x2 mark																		
6.	(i) Correct name for the tool... <i>Long nose/Pointed/Needle-nose pliers</i> <i>Pliers</i>	 3 marks 1 mark																		
	(ii) Correct use... <i>Gripping, holding items, cutting wire, tightening</i>	2 marks																		
7.	<table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <thead> <tr style="background-color: black; color: white;"> <th style="padding: 5px;">Trees</th> <th style="padding: 5px;">Hardwood</th> <th style="padding: 5px;">Softwood</th> </tr> </thead> <tbody> <tr> <td style="padding: 5px;">Ash</td> <td style="padding: 5px;">✓</td> <td style="padding: 5px;"></td> </tr> <tr> <td style="padding: 5px;">Sitka Spruce</td> <td style="padding: 5px;"></td> <td style="padding: 5px;">✓</td> </tr> <tr> <td style="padding: 5px;">Douglas Fir</td> <td style="padding: 5px;"></td> <td style="padding: 5px;">✓</td> </tr> <tr> <td style="padding: 5px;">Birch</td> <td style="padding: 5px;">✓</td> <td style="padding: 5px;"></td> </tr> <tr> <td style="padding: 5px;">Holly</td> <td style="padding: 5px;">✓</td> <td style="padding: 5px;"></td> </tr> </tbody> </table>	Trees	Hardwood	Softwood	Ash	✓		Sitka Spruce		✓	Douglas Fir		✓	Birch	✓		Holly	✓		5 x 1 mark
Trees	Hardwood	Softwood																		
Ash	✓																			
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Holly	✓																			
8.	   <i>Secure workpiece, wear goggles, dust extraction, wear ear protection, use correct speed ...</i>	2 x 2 marks 1 x 1 mark																		

9.	Most damaging stage... <i>Larva</i>		5 marks																		
10.	(i) Method of timber conversion... <i>Quarter/Radial/Rift Sawing</i>		3 marks																		
	(ii) Grain pattern... <i>Silver grain</i>		2 marks																		
11.	(i) Correct name for power tool... <i>Router</i>		3 marks																		
	(ii) Purpose of tool... <i>Cutting mouldings, joints, grooves, rebates, carvings...</i>		2 marks																		
12.	Use of a computer on JC project... <i>To produce drawings, for research and investigation, production of folder, CNC...</i>		1 x 3 marks 1 x 2 marks																		
13.	(i) Name of manufactured board... <i>Plywood</i>		1 x 3marks																		
	(ii) Two advantages... <i>Cheaper, more stable, stronger, less defects, available in large sheets, less prone to insect attack, conserves hardwoods reduces deforestation...</i>		2 x 1 marks																		
14.	<table border="1" data-bbox="359 1400 1109 1668"> <thead> <tr> <th>Saws</th> <th>Curved</th> <th>Straight</th> </tr> </thead> <tbody> <tr> <td>Dovetail saw</td> <td></td> <td>✓</td> </tr> <tr> <td>Band saw</td> <td>✓</td> <td></td> </tr> <tr> <td>Scroll saw</td> <td>✓</td> <td></td> </tr> <tr> <td>Circular saw</td> <td></td> <td>✓</td> </tr> <tr> <td>Rip saw</td> <td></td> <td>✓</td> </tr> </tbody> </table>	Saws	Curved	Straight	Dovetail saw		✓	Band saw	✓		Scroll saw	✓		Circular saw		✓	Rip saw		✓		5 x 1 mark
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15.	(i) Brass in an alloy of... <i>Copper and Zinc</i>		1 x 3 marks 1 x 2 marks																		
16.	Two conditions for dry rot... <i>Moisture, warmth, food source, stagnant air, spores</i>		3 marks 2 marks																		

17.	Completed sketch of Stopped\Housing Joint ... <i>Housed upright Housing</i> 	3 marks 2 marks																																			
18. (i)	Identification of layer ... <i>Veneer</i>	3 marks																																			
	Method of peeling... <i>Rotary</i>	 2 marks																																			
19. (i)	Position of belt for minimum speed... <i>Belt on smallest pulley on motor and largest on spindle shaft</i> <i>Nóta: I gcás iarrthóiri a d'fhreagair trí Ghaeilge, glac leis an gcrios i gceachtar den dá shuíomh, ar dheis nó ar clé.</i> 	5 marks																																			
20.	Cutting list...  <table border="1" data-bbox="365 983 1193 1361"> <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>150</td> <td>130</td> <td>15</td> </tr> <tr> <td>Front</td> <td>1</td> <td>210</td> <td>120</td> <td>15</td> </tr> <tr> <td>Back</td> <td>1</td> <td>250</td> <td>250</td> <td>15</td> </tr> <tr> <td>Sides</td> <td>2</td> <td>240</td> <td>70</td> <td>15</td> </tr> <tr> <td>Roof</td> <td>1</td> <td>165</td> <td>150</td> <td>15</td> </tr> <tr> <td>Dowel</td> <td>2</td> <td>50</td> <td colspan="2">Ø10</td> </tr> </tbody> </table>	Description	Quantity	Length	Width	Thickness	Base	1	150	130	15	Front	1	210	120	15	Back	1	250	250	15	Sides	2	240	70	15	Roof	1	165	150	15	Dowel	2	50	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.

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>Evaluation –</p> <p><i>Review of project in relation to the given brief. Assessing of artefact with respect to function, appearance, proportion, shape, safety, problems encountered, modifications etc.</i></p>	<p>5 marks</p> <p>5 marks</p>	10
(ii)	<p>Design solution for desktop unit...</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>16 marks</p>	16
(iii)	<p>Two specific design requirements...</p> <p><i>Any two relevant requirements to the design: Access, safety, appearance, function, stability, size, shape, proportion, suitability...</i></p>	2 x 3 marks	6
(iv)	<p>Incorporation of design requirements...</p> <p><i>Note and description must relate to part (iii)</i></p>	<p>3 + 1 marks</p> <p>3 + 1 marks</p>	8



QUESTION	ANSWER	MARKS												
3. (i)	<p>Method of Seasoning...</p> <p style="text-align: center;">Kiln Seasoning (Compartment/Progressive) Artificial Seasoning</p> 	8 marks												
(ii)	<p>Process of seasoning ...</p> <ul style="list-style-type: none"> • <i>Timber is stacked on a trolley with stickers between each plank to allow air circulation.</i> • <i>Heated steam is piped into kiln to warm up whole stack and prevent rapid drying.</i> • <i>Heating coils warm the air and humidity is reduced slowly.</i> • <i>Fans are used to circulate the steam and warm air to heat the stack uniformly.</i> • <i>Moisture escapes from the kiln through vents.</i> 	4 x 3 marks												
(iii)	<p>Other seasoning method...</p> <p style="text-align: center;">Natural/Air Seasoning</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 50%;">Disadvantages</th> <th style="width: 50%;">Advantages</th> </tr> </thead> <tbody> <tr> <td>Slow</td> <td>Inexpensive</td> </tr> <tr> <td>No control over final MC</td> <td>Easily managed</td> </tr> <tr> <td>MC of only 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	MC of only 18% achievable	No specialist labour required	Weather dependent	No expensive equipment needed	Boards prone to fungus/insect attack	Not wasteful of energy	6 marks
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(iv)	<p>Reasons for board warping...</p> <p>..</p> <ul style="list-style-type: none"> • Poor stacking of timber • Incorrect drying schedule • Uneven shrinkage <p style="text-align: center;">Sketch of preventative measures</p> 	4 + 2 marks												

8

12

14




6

QUESTION	ANSWER	MARKS
4. (i)	<p>Correct names for woodboring tools...</p> <p><i>A =Brace/ Hand Brace/Ratchet Brace/Crank Brace</i></p> <p><i>B =Hand Drill/Wheel Drill</i></p> <p><i>C = PillarDrill/Drilling Machine/Bench Drill</i></p> 	3 x 5 marks
(ii)	<p>Name of part...</p> <p><i>Ratchet (mechanism)</i></p>  <p>Function...</p> <ul style="list-style-type: none"> • <i>Allows bit to remain stationary in the wood while the brace is being rotated.</i> • <i>Allows movement of bit in one direction only.</i> • <i>Allows brace to be used in tight spaces.</i> 	3 marks 4 marks
(iii)	<p>Boring a hole through a piece of wood...</p> <ul style="list-style-type: none"> • <i>Mark centre for hole.</i> • <i>Insert bit in brace.</i> • <i>Secure wood in vice.</i> • <i>Place feed screw at centre point, apply pressure and rotate brace.</i> • <i>When feed screw appears through other side, turn timber around and drill from other side inserting feed screw into existing hole.</i> <p style="text-align: center;">OR</p> <ul style="list-style-type: none"> • <i>Mark centre for hole.</i> • <i>Insert bit in brace.</i> • <i>Secure wood in vice with waste behind to support it.</i> • <i>Place feed screw at centre point, apply pressure and rotate brace.</i> • <i>Rotate brace until bit passes through the piece.</i> 	12+6 marks

15

7

18

QUESTION	ANSWER	MARKS	
5(B). (i) 	Carving methods... <i>A=Chip carving</i> <i>B=Relief carving</i> <i>C=Carving in the Round/Wood Sculpture</i>	4 marks 4 marks 4 marks	12
(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> 	6 + 4 marks	10
(iii) 	Suitable clear finish for the sculpture ... <i>Mark for any suitable applied finish:</i> <i>Lacquer, varnish, wax, oil ...</i> Reasons ... <i>Reasons appropriate to the selected finish:</i> <i>Appearance, ease of application, durability, protection, non-toxic...</i>	3 marks 2 x 3 marks	9
(iv)	Application of chosen finish... <ul style="list-style-type: none"> • <i>Working with the grain</i> • <i>Application of first coat</i> • <i>Cutting back when dry</i> • <i>Application of additional coats .</i> • <i>Use of cloth if wax or oils.(and buff)</i> 	9 marks	9

