



Coimisiún na Scrúduithe Stáit
State Examinations Commission

Junior Certificate 2011

Marking Scheme

Materials Technology Wood

Higher Level



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State Examinations Commission













Junior Certificate Examination 2011

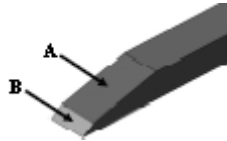

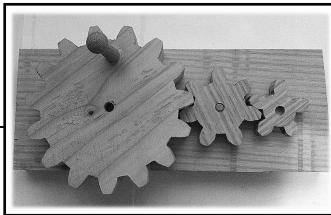

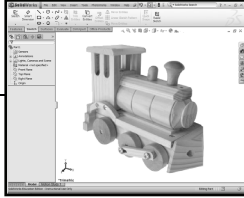
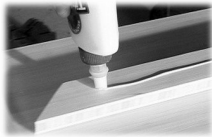

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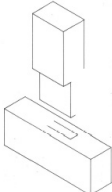
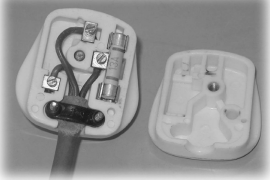
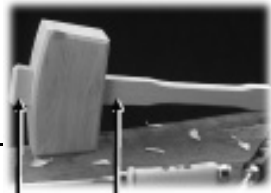
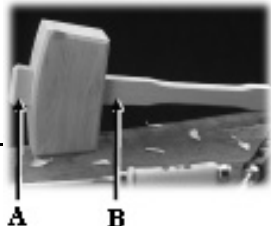
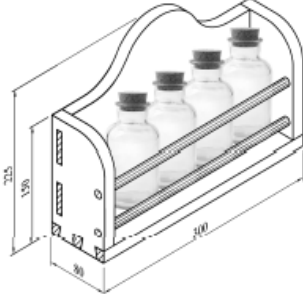
*The Sample solutions shown are presented as example answers.
All other valid solutions are acceptable and are marked accordingly.*

SECTION A

Mark 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 use of part labelled X... <i>To withdraw nails from wood, levering</i>	2 marks
2.	Woodscrew.. <i>A=Head</i> <i>B=Shank</i> <i>C=Thread</i>	 2x2 marks 1x1 marks
3. (i)	Two main categories of plastic... <i>Category 1=Thermoplastic</i> <i>Category 2=Thermosetting plastic</i>	 2x2 marks
(ii)	Recyclable... <i>Category 1=Thermoplastic</i>	 1x1 mark
4.	Hinge types...  Concealed Cabinet/Blum Hinge  Butt Hinge  T-Hinge	2x2 marks 1x1 marks
5.	Common Irish trees....  <i>Sycamore</i>  <i>Horse Chestnut</i>  <i>Ash</i>	2x2 marks 1x1 mark
6. (i)	Correct name for the tool... <i>Scriber</i>	 3 marks
(ii)	Appropriate use... <i>Marking lines</i>	2 marks
7. (i)	Timber defect... <i>Cup Shake</i> <i>Shake</i>	 3 marks 1 mark
(ii)	Cause... <i>Harsh weather conditions, poor felling, old age.</i>	2 marks

8.	(i)	Main difference between metals... <i>Ferrous contain iron and rust</i>		3 marks
	(ii)	<i>Mild Steel = Ferrous Lead = Non Ferrous</i>		2 x 1 mark
9.		Angles... <i>A=Grinding Angle</i> <i>B =Sharpening/Honing Angle</i>		1 x 3 marks 1 x 2 marks
10.		Force applied to wood... <i>Compression</i>		5 marks
11.	(i)	Direction for gearwheel C... <i>Clockwise</i>		3 marks
	(ii)	Speed of C... <i>126 rpm</i>		2 marks
12.		Eye Protection... <i>While using lathe, scroll saw, morticer, sander, pillar drill, band saw...</i>		1 x 3 marks 1 x 2 marks
13.	(i)	CAD... <i>Computer Aided Design</i>		3 x 1 marks
	(ii)	One advantage... <i>Accuracy, faster, reproducible...</i>		1 x 2 marks
14.		Glues... <i>PVA, Epoxy resin, Urea formaldehyde</i> <i>Contact Adhesive, Thermo glue, Casein,</i> <i>Animal, Scotch, Cyanoacrylates</i> Use... <i>Use appropriate to named glue</i>		1 x 2 marks 1 x 1 marks 2 x 1 mark
15.	(i)	Name of machine... <i>Morticer</i>		1 x 3 marks
	(ii)	Safety precaution... <i>Wear goggles, secure workpiece, stop machine before adjusting, tie up long hair, remove jewellery</i>		1 mark
		Reason... <i>Reason appropriate to precaution</i>		1 mark

16.	Completed sketch of Mortice and Tenon Joint ... <i>Tenon</i> <i>Mortice</i> 	3 marks 2 marks																									
17. (i)	Plug terminals... <i>A=Neutral/Negative</i> <i>B=Earth</i> <i>C=Live/Positive</i> 	3 x 1 mark																									
17. (ii)	Function of fuse... <i>Safety, protects against overloading or short circuits...</i>	1 x 2 marks																									
18.	EMC... <i>E=Equilibrium</i> <i>M=Moisture</i> <i>C=Content</i>	2 x 2 marks 1 x 1 mark																									
19. (i)	Mallet made from... <i>Beech</i> 	3 marks																									
19. (ii)	Reason for taper in handle... <i>To prevent head from falling off</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>Base</td> <td>1</td> <td>300</td> <td>80</td> <td>15</td> </tr> <tr> <td>Ends</td> <td>2</td> <td>150</td> <td>80</td> <td>15</td> </tr> <tr> <td>Back</td> <td>1</td> <td>300</td> <td>210</td> <td>15</td> </tr> <tr> <td>Dowel</td> <td>2</td> <td>300</td> <td colspan="2">Ø9</td> </tr> </tbody> </table> 	Description	Quantity	Length	Width	Thickness	Base	1	300	80	15	Ends	2	150	80	15	Back	1	300	210	15	Dowel	2	300	Ø9		5 x 1 mark
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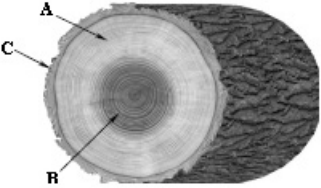
Running total of allowed questions for this section to be recorded and shown as indicated at the marking conference.

SECTION B

Mark 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 (1200)</i></p> <p><i>Showing overall height (1000)</i></p> <p><i>Showing position and width of legs (150)</i></p> <p><i>Showing depth of table top(150)</i></p> <p><i>Showing thickness of table top ends</i></p> <p><i>Showing thickness of table top base</i></p> <p><i>Showing position and width of bottom rails</i></p> <p><i>Showing thickness of bottom rails</i></p> <p>End view -</p> <p><i>Setting out/transferring overall height</i></p> <p><i>Setting out to width (600)</i></p> <p><i>Showing depth of table top (150)</i></p> <p><i>Showing thickness of legs (30)</i></p> <p><i>Showing position and width of bottom rail</i></p> <p><i>Showing edge of bottom rail</i></p> <p><i>Showing thickness of table top base</i></p> <p><i>Showing thickness of table top sides</i></p> <p><i>Showing position and size of goal</i></p> <p>General -</p> <p><i>Hidden detail (any 4 lines)</i></p> <p><i>Scale</i></p> <p><i>Dimensions (any 4)</i></p> <p><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</p> <p>1 mark</p> <p>3 x 1 mark</p> <p>1 mark</p> <p>2 x 1mark</p> <p>1 mark</p> <p>2 x 2 mark</p> <p>2 x 1 mark</p> <p>1 mark</p> <p>1 marks</p> <p>1 mark</p> <p>2 x 1 mark</p> <p>2 x 1 mark</p> <p>1 mark</p> <p>1 mark</p> <p>2 x 1 mark</p> <p>2 x 1 mark</p> <p>1 mark</p> <p>1 mark</p> <p>1 mark</p> <p>2 mark</p>	<p>15</p> <p>13</p> <p>5</p>
(ii)	<p>Method of jointing C to D...</p> <p><i>Box/Lapped/Secret Dovetail</i></p> <p><i>Finger joint</i></p> <p><i>Lap joint</i></p> <p><i>Mitred</i></p> <p><i>Dowelled joint</i></p> <p><i>Biscuit joint</i></p> <p><i>Concealed Screws/Pocket Screwed</i></p> <p><i>Domino</i></p> <p><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/Solution –</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 solution</i></p>	5 marks 5 marks	10
(ii)	<p>Design solution for First Aid 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 (capable of being wall-mounted).</i></p>	6 marks ↓ 12 marks ↓ 16 marks	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>Notes and sketches must relate to part (iii)</i></p>	3 + 1 marks 3 + 1 marks	8

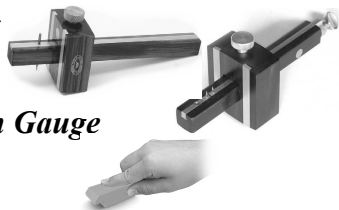
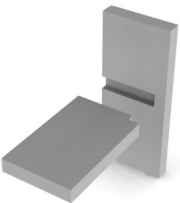
QUESTION	ANSWER	MARKS															
3. (i) 	Cross section of tree... A=Sapwood: Paler in colour, living part of tree, carries sap from roots to leaves B= Heartwood: Darker in colour, dead part of tree, supports tree C=Bark: Thick corky outer layer, serves to protect tree, prevents evaporation	3 x 2 marks 3 x 2 marks															
(ii)	Hardwoods and softwoods ... <table border="1"> <thead> <tr> <th><i>Headings</i></th> <th><i>Hardwoods</i></th> <th><i>Softwoods</i></th> </tr> </thead> <tbody> <tr> <td><i>Leaves</i></td> <td><i>Broad. Deciduous</i></td> <td><i>Needle. Evergreen</i></td> </tr> <tr> <td><i>Seeds</i></td> <td><i>In a fruit, berry or nut.</i></td> <td><i>In cones</i></td> </tr> <tr> <td><i>Timber</i></td> <td><i>Hard, darker, durable, more expensive.</i></td> <td><i>Softer, paler, less durable, cheaper</i></td> </tr> <tr> <td><i>Climate</i></td> <td><i>Temperate to tropical</i></td> <td><i>Cooler to temperate</i></td> </tr> </tbody> </table>	<i>Headings</i>	<i>Hardwoods</i>	<i>Softwoods</i>	<i>Leaves</i>	<i>Broad. Deciduous</i>	<i>Needle. Evergreen</i>	<i>Seeds</i>	<i>In a fruit, berry or nut.</i>	<i>In cones</i>	<i>Timber</i>	<i>Hard, darker, durable, more expensive.</i>	<i>Softer, paler, less durable, cheaper</i>	<i>Climate</i>	<i>Temperate to tropical</i>	<i>Cooler to temperate</i>	4 x 2 marks
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(iii)	Chemical Reaction... <p style="text-align: center;"><i>Photosynthesis</i></p> Two raw materials... <p style="text-align: center;"><i>CO₂, Water, Minerals, Sunlight</i></p>	6 marks 2 x 3 marks															
(iv)	Reasons why tropical rainforests should be conserved ... <p style="text-align: center;"><i>Protection of habitats, reduction of CO₂ levels, aesthetics, rare flora/fauna, prevent silting of watercourses, renewable supply of hardwoods...</i></p> Approaches to the conservation of rain forests ... <p style="text-align: center;"><i>Use of softwoods, use of manufactured boards, use veneers not solid timber, reuse, recycle... (accept political answers)</i></p>	2 x 2 marks 2 x 2 marks															



12

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QUESTION	ANSWER	MARKS	
4. (i)	Correct names for woodboring tools...  <p> <i>A = Marking Gauge</i> <i>B = Mortice Gauge, Combination Gauge</i> <i>C = Thumb Gauge</i> </p>	3 x 4 marks	12
(ii)	Description of setting and use of mortice gauge... <ul style="list-style-type: none"> • <i>Loosen thumbscrew</i> • <i>Adjust stem thumbscrew to set distance between the spurs</i> • <i>Set required distance using rule between stock and adjustable spur</i> • <i>Tighten thumbscrew and check measurements.</i> • <i>Place stock against the wood</i> • <i>Mark points at end of gauge line</i> • <i>Apply inward pressure against the edge of the wood</i> • <i>Drag spurs along wood to mark parallel lines</i> 	3 x 1 + 3 marks 3 x 1 + 3 marks	12
(iii)	 Marking out and removing waste from stopped housing... <ul style="list-style-type: none"> • <i>Square lines across side and edge of timber to mark out housing</i> • <i>Square waste line on other piece, then draw line back from waste line the required depth of the housing</i> • <i>Set gauge to required depth and gauge depth of housing on edge of housed piece</i> • <i>Use gauge to mark length of housing</i> • <i>With same setting gauge length of housing from the edge of the other piece</i> • <i>Score with marking knife and mark in waste</i> • <i>Set depth of mortice/pillar drill (with Forstener bit)/chisel with masking tape</i> • <i>Drill/chop out the waste at the inside of the housing</i> • <i>Using tenon saw, saw down each side of the housing</i> • <i>Employ chisel to remove the waste, working at an angle initially and gradually paring horizontally</i> • <i>Place other piece vertically in the vice and saw as far as joint line</i> • <i>Then rotate piece in vice to horizontal and remove waste with the saw</i> 	3 x 1 + 3 marks 3 x 1 + 3 marks	12
(iv)	Safety precautions when using a chisel... <p><i>Both hands behind cutting edge, secure workpiece, work away from body, keep sharp, carry it properly...</i></p>	2 x 2 marks	4


QUESTION	ANSWER	MARKS
5(A). (i) 	Lathe parts and functions... A=Toolrest: Supports chisels and gouges while turning. B=Dead/Live Centre: Supports end of spindle and allows it rotate C=Emergency stop: Allows lathe to be stopped immediately in case of emergency	2 x 2 marks 2 x 2 marks 2 x 2 marks
(ii) 	Method of making an identical leg... <ul style="list-style-type: none"> • Rule and callipers...measuring critical points...mark lines on the spindle...use callipers for diameter • Using a profile template check work repeatedly as you proceed...marking out and cutting of profile...applying to workpiece • Use of a contour gauge...setting gauge...applying to spindle • Using a copying lathe...setting up...basic knowledge of copying lathe or copying attachment displayed 	3 x 2 + 4 marks
(iii)	Preparation of wood for turning... <ul style="list-style-type: none"> • Draw the diagonals on both ends of piece to locate centre • Draw the largest possible circle on the ends using this centre • Draw tangents to this circle to create an octagon on the face • Place in vice and plane down the corners • Punch hole in centre of timber to receive drive centre • Remove drive centre from lathe and insert into timber using a mallet Mounting on the lathe... <ul style="list-style-type: none"> • Adjust tailstock to take length of timber • Replace drive centre into headstock and attach timber • Tighten live centre, using handwheel, and lock into place • Adjust toolrest to appropriate height and position so that it is as close to the work as possible, but without touching it as it rotates • Turn spindle by hand to ensure free movement 	3 x 1 + 3 marks 3 x 1 + 3 marks
(iv)	Three safety precautions... Wear face shield, tie up hair, no loose clothing, remove jewellery, remove toolrest when sanding, secure work before commencing, rotate work before starting to ensure free movement ...	3 x 2 marks

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QUESTION	ANSWER	MARKS
5(B). (i)	<p>Three clear finishes...</p> <p style="text-align: center;"><i>Varnish, wax, lacquer, oils, French polish, liquid paraffin...</i></p> <p>Select finish... <i>two appropriate reasons for choice. Looks well, durable, protects, non-toxic, easy to apply...</i></p>	<p>3 x 3 marks</p> <p>2 x 2 marks</p>
(ii) 	<p>Preparing the wood ...</p> <ul style="list-style-type: none"> • <i>Punch any nails or pins below the surface.</i> • <i>Remove any pencil marks or scratches using a smoothing plane or scraper</i> • <i>Fill any holes or imperfections</i> • <i>Sand table moving from coarse to fine grit paper</i> • <i>Dust down</i> • <i>Wipe with a damp cloth and cut back with very fine abrasive paper when dry</i> • <i>Wipe down with white spirits</i> 	<p>4 x 2 + 4 marks</p>
(iii)	<p>Safety precautions with finishes...</p> <p style="text-align: center;"><i>Wear protective clothing, use in ventilated area, wash hands after use, do not dispose of in drains or water courses, follow manufacturer's instructions...</i></p>	<p>2 x 3 mark</p>
(iv)	<p>Suitable hardwood for the manufacture of the coffee table ...</p> <p style="text-align: center;"><i>Mark for any suitable named hardwood</i></p> <p>Reasons ...</p> <p style="text-align: center;"><i>Reasons appropriate to selected material : Cost, appearance, workability, durability, finish...</i></p>	<p>3 marks</p> <p>2 x 3 marks</p>

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