

Coimisiún na Scrúduithe Stáit State Examinations Commission

JUNIOR CERTIFICATE 2010

MARKING SCHEME

MATERIALS TECHNOLOGY WOOD

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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.

QUESTI	ON	ANSWER	MARKS
1.	(i)	Correct name for the tool	
		Marking Gauge Gauge	3 marks 1 mark
	(11)	Specific use	
		Marking a line parallel to an edge, marking joints.	2 marks
2.		Three common Irish trees	
			2x2 marks 1x1 marks
	~•×	Birch (or similar) Oak Beech	
3.	(i)	Name of force acting on blade	
		Tension	5 marks
4.		Conditions for photosynthesis	
		CO2, Sap (water&minerals), Chlorophyll, Sunlight	2x2 marks 1x1 marks
5.		Parts of tree section	1 2
		A=Sapwood B=Heartwood	1x3 marks 1x2 mark
6.	(i)	Correct name for the tool	
		Long nose/Pointed/Needle-nose pliers Pliers	3 marks 1 mark
	(ii)	Correct use <i>Gripping, holding items, cutting wire, tightening</i>	2 marks
7.		Trees Hardwood Softwood	
		Ash 🗸	
		Sitka Spruce ✓ Douglas Fir ✓	5 x 1 mark
		Birch 🗸	
		Holly ✓	
8.		Secure workpiece, wear goggles, dust extraction, wear ear protection, use correct speed	2 x 2 marks 1 x 1 mark

9.		Most damaging stage	
		Larva	5 marks
10.	(i)	Method of timber conversion Quarter/Radial/Rift Sawing	3 marks
	(ii)	Grain pattern Silver grain	2 marks
11.	(i)	Correct name for power tool Image: Correct name for power tool Router	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</i> <i>and investigation, production of folder,</i> <i>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,</i> <i>less defects, available in large sheets,</i> <i>less prone to insect attack,</i> <i>conserves hardwoods</i> <i>reduces deforestation</i>	2 x 1 marks
14.		SawsCurvedStraightDovetail saw✓Band saw✓Scroll saw✓Circular saw✓Rip saw✓	5 x 1 mark
15.	(i)	Brass in an alloy of Copper and Zinc	1 x 3 marks 1 x 2 marks
16.		Two conditions for dry rot Moisture, warmth, food source, stagnant air, spores	3 marks 2 marks

17.	Completed sketch	of Stopped	Housing Jo	oint		
	Нои Нои	ised uprigh Ising	ť			3 marks 2 marks
18. (i)	Identification of la <i>Vene</i>	ayer <i>er</i>				3 marks
(ii)	Method of peeling <i>Rote</i>	3 ary				2 marks
19. (i)	Position of belt for minimum speed Belt on smallest pulley on motor and largest on spindle shaft Nóta: I gcás iarrthóirí a d'fhreagair trí Ghaeilge, glac leis an gcrios i gceachtar den dá shuíomh, ar dheis nó ar clé.				5 marks	
20.	Cutting list					
<u>19</u>	Description Base	Quantity 1	Length 150	Width 130	Thickness 15	
	Front		210	120	15	5 x 1 mark
R	Back	1	250	250	15	
	Sides	2	240	70	15	
	Roof	1	165	150	15	
	Dowel	2	50	ØI	0	

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

SECTION B

Mark the best 3 answers. Check <u>all</u> stationery and indicate running total and disallowed marks as indicated at the marking conference.

QUESTION	ANSWER	MARKS	
1. (i)	Preparation of working drawing		
	Elevation -		
	Setting out overall width (320)	1 mark	
	Showing overall height	1 mark	
	Showing width of legs (40)	1 mark	
	Showing position and thickness of top table	2 x 1 mark	
	Showing position and width of bottom rail	2 x 1mark	
	Showing position and width of back rail	2 x 1 mark	
	Showing position and thickness of seat	2 x 1 mark	
	Showing position and width of backrest	2 x 1 mark	
	Finding the centre and drawing the curve to the	2 x 1 mark	15
	back of seat		
	End view -		
	Setting out/transferring overall height	1 mark	
	Setting out width (308)	1 marks	
	Showing position and thickness of table	2 x 1 mark	
	Showing position and thickness of back rail	2 x 1 mark	
	Showing position and thickness of seat	2 x 1 mark	
	Showing position and thickness of back rest	2 x 1 mark	
	Showing position and thickness of legs (18)	2 x 1 mark	
	Finding the centre and drawing curves to legs	2 x 1 mark	14
	General - Hidden detail (any 4 lines) Scale Dimensions (any 4)	1 mark 1 mark 1 mark	
	Draughtsmanship, presentation	2 mark	5
	1. If isometric drawing presented, mark as per scheme		
	and divide by 2 at end		
	2. If the wrong scale is used, award no marks for height		
	or width in elevation or for scale		
	3. If sketched, mark as per instructions at conference		
(ii)	Method of jointing C to D		
()	Mortice and Tenon		
	Concealed Screws/Pocket Screwed		
	Halving or Bridle Joint	4 + 2 marks	
	Dowelled joint		
	Domino		
		2 marks	
	Description/name only		6

QUESTION	ANSWER	MARKS	
2. (i)	Explanation of steps in design process		
	Sketches/Working Drawings -		
	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.	5 marks	
	Evaluation –		
	Review of project in relation to the given brief. Assessing of artefact with respect to function, appearance, proportion, shape, safety, problems encountered, modifications etc.	5 marks	1
(ii)	Design solution for desktop unit		
	Basic unit/box without any design features (sketch only)	5 marks	
	Fair attempt to display items in an attractive, compact unit. (Must include notes)	10 marks	
	Good, well balanced, well sketched design, showing some innovation.	16 marks	1
(iii)	Two specific design requirements		-
	Any two relevant requirements to the design: Access, safety, appearance, function, stability, size, shape, proportion, suitability	2 x 3 marks	
(iv)	Incorporation of design requirements		6
	Note and description must relate to part (iii)	3 + 1 marks 3 + 1 marks	
			8

QUEST	FION	ANSWER		MARKS	
3.	(i)	Method of Seasoning Kiln Seasoning (Compartment/Progressi Artificial Seasoning	ive)	8 marks	8
	(ii)	 Process of seasoning Timber is stacked on a t each plank to allow air Heated steam is piped in and prevent rapid dryin Heating coils warm the slowly. Fans are used to circul heat the stack uniform! Moisture escapes from the 	rolley with stickers between circulation. nto kiln to warm up whole stack g. air and humidity is reduced ate the steam and warm air to y. the kiln through vents.	4 x 3 marks	
	(iii)	Other seasoning method Natural/Air Season	ing	6 marks	12
		Disadvantages Slow No control over final MC MC of only 18% achievable Weather dependent Boards prone to fungus/insect attack	Advantages Inexpensive Easily managed No specialist labour required No expensive equipment needed Not wasteful of energy	2 x 2 marks 2 x 2 marks	14
	(iv)	Reasons for board warping • Poor stacking of timber • Incorrect drying schedule • Uneven shrinkage Sketch of preventative mea	asures	4 + 2 marks	6

QUESTION	ANSWER	MARKS	
4. (i)	Correct names for woodboring tools A =Brace/ Hand Brace/Ratchet Brace/Crank Brace B =Hand Drill/Wheel Drill C = PillarDrill/Drilling Machine/Bench Drill Solution Solution Solut	3 x 5 marks	
(ii)	Name of part Ratchet (mechanism) Function	3 marks	17
	 Allows bit to remain stationary in the wood while the brace is being rotated. Allows movement of bit in one direction only. Allows brace to be used in tight spaces. 	4 marks	
(iii)	 Boring a hole through a piece of wood Mark centre for hole. Insert bit in brace. Secure wood in vice. Place feed screw at centre point, apply pressure and rotate brace. When feed screw appears through other side, turn timber around and drill from other side inserting feed screw into existing hole. OR Mark centre for hole. Insert bit in brace. Secure wood in vice with waste behind to support it. Place feed screw at centre point, apply pressure and rotate brace. Rotate brace until bit passes through the piece. 	12+6 marks	7
			18

QUESTION	ANSWER	MARKS	
5(A).	Surfaces (6) Fold Lines (2/5) Fillets (2/4) Quality of drawing	6 x 1 marks 2 x 1 marks 2 x 1 marks 2 x 1 marks 2 marks	12
(ii)	 Cutting of stand Mark out development on acrylic. Cut out acrylic using a suitable saw and relevant method. THEN Cross file to the line. Draw file for a smooth finish OR Using a sander/grinder remove any remaining waste to the line 	4 + 2 marks	
	 Forming of stand Prepare a suitable former for the required shape. Place acrylic on supporting bars of the strip heater. Align fold line with electric element. When pliable remove from heat and shape using the former 	6 + 2 marks	14
(iii)	Design for wooden base Sketch	6 marks	6
(iv)	 Drilling holes in Acrylic Secure acrylic in vice or clamp. Select drill bit with a larger diameter than screw shank. Place waste wood beneath or tape over centre for hole. Drill with constant, light, even pressure. 	2 + 2 marks	
	 Drilling holes in wood Select drill bit with smaller diameter than the screws. Mark centres for holes. Secure timber. Make pilot hole into base. 	2 + 2 marks	8

QUESTION	ANSWER	MARKS	
5(B). (i)	Carving methods		
(ii)	A=Chip carving B=Relief carving C=Carving in the Round/Wood Sculpture Transferring design to wood	4 marks 4 marks 4 marks	12
	 Tape the carving drawing to one edge of the wood. Insert a sheet of carbon paper underneath the drawing. Trace over the design. Check all lines are visible on the wood before removing sheets. OR Cut around carving drawing. Tape this template to the wood. Trace around the template with a pencil. Sketch in missing parts as accurately as possible 	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	3 marks	
	<i>Reasons appropriate to the selected finish:</i> <i>Appearance, ease of application, durability, protection, non-toxic</i>	2 x 3 marks	9
(iv)	 Application of chosen finish Working with the grain Application of first coat Cutting back when dry Application of additional coats . Use of cloth if wax or oils.(and buff) 	9 marks	9