Coimisiún na Scrúduithe Stáit
State Examinations Commission

Junior Certificate 2014

Marking Scheme

Materials Technology Wood

Higher Level

Note to teachers and students on the use of published marking schemes

Marking schemes published by the State Examinations Commission are not intended to be standalone documents. They are an essential resource for examiners who receive training in the correct interpretation and application of the scheme. This training involves, among other things, marking samples of student work and discussing the marks awarded, so as to clarify the correct application of the scheme. The work of examiners is subsequently monitored by Advising Examiners to ensure consistent and accurate application of the marking scheme. This process is overseen by the Chief Examiner, usually assisted by a Chief Advising Examiner. The Chief Examiner is the final authority regarding whether or not the marking scheme has been correctly applied to any piece of candidate work.

Marking schemes are working documents. While a draft marking scheme is prepared in advance of the examination, the scheme is not finalised until examiners have applied it to candidates' work and the feedback from all examiners has been collated and considered in light of the full range of responses of candidates, the overall level of difficulty of the examination and the need to maintain consistency in standards from year to year. This published document contains the finalised scheme, as it was applied to all candidates' work.

In the case of marking schemes that include model solutions or answers, it should be noted that these are not intended to be exhaustive. Variations and alternatives may also be acceptable. Examiners must consider all answers on their merits, and will have consulted with their Advising Examiners when in doubt.

Future Marking Schemes

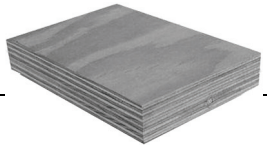
Assumptions about future marking schemes on the basis of past schemes should be avoided. While the underlying assessment principles remain the same, the details of the marking of a particular type of question may change in the context of the contribution of that question to the overall examination in a given year. The Chief Examiner in any given year has the responsibility to determine how best to ensure the fair and accurate assessment of candidates' work and to ensure consistency in the standard of the assessment from year to year. Accordingly, aspects of the structure, detail and application of the marking scheme for a particular examination are subject to change from one year to the next without notice.

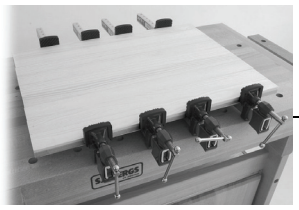
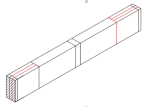
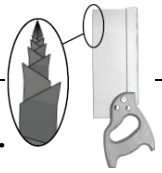
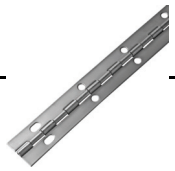
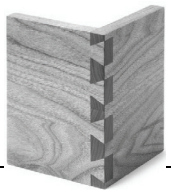
The Sample solutions where shown are presented as example answers.

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 Examiners

QUESTION		ANSWER	MARKS
1.	(i)	Correct name for the tool... *Drill* ***Cordless/Battery operated Drill*** 	**1 mark** **3 marks**
	(ii)	Specific use of cordless drill… ***Boring holes, drilling, inserting screws…***	**2 marks**
2.		Applied finishes**...** ***Finishes: Suitable Oils, Varnish, Paint, Stain, Lacquer,Wax…*** ***Reasons: Waterproof, durable, looks well, protects…*** 	**1 x 2 marks** **3 x 1 mark**
3.	(i)	Manufactured board… ***Plywood*** 	**3 marks**
	(ii)	Advantage… ***Cheaper, stronger, large sheets, more stable...***	**2 marks**
4.	(i)	Name of Tool… ***Awl, bradawl*** 	**3 marks**
	(ii)	Appropriate use… ***Boring small pilot holes in wood…***	**2 marks**
5.	`(i)	Defect… *Shake* ***Star shake, heart shake, radial shake*** 	**1 mark** **3 marks**
	(ii)	***Shrinkage due to old age or drying out***	**2 marks**
6.		Advantages of CNC Router… ***Faster, easier, more accurate, safer, allows for repetitive work….*** 	**1 x 3 marks** **1 x 2 marks**
7.		Tree identification…    ***Oak*** ***Hazel*** ***Beech***	**2 x 2 marks** **1 mark**
8.	(i)	Power tool… ***Biscuit Jointer*** 	**3 marks**
	(ii)	Use… ***Cuts slots in wood to allow a biscuit joint to be formed…***	**2 marks**

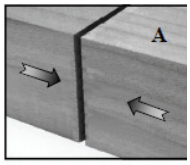
9.		Screw driving systems… ***A***  ***Slotted, parallel, flat head*** ***B***  ***Pozidrive*** ***C***  ***Phillips, Frearson***	**2 x 2 marks** **1 x 1 mark**
10.	(i)	Cramp… ***Sash, (T-)bar*** 	**3 marks**
	(ii)	Force… ***Compression***	**2 marks**
11.		Moisture content… ***Calculation***  ***18%***	**3 marks** **5 marks**
12 		Marking out of Bridle Joint… ***feasible marking out*** ***gauge lines, shoulder lines*** 	**1 x 3 marks** **1 x 2 marks**
13.		Surface finish… ***Protection, appearance, hygienic…*** 	**1 x 3 marks** **1 x 2 marks**
14.	(i)	Woodwork tool… *Chisel* ***Bevel-edged/ paring chisel*** 	**1 mark** **3 marks**
	(ii)	Precaution… ***Both hands behind cutting, edge, secure work piece, keep sharp, wear goggles …***	**2 marks**
15.	(i)	Saw feature … ***Set*** 	**3 marks**
	(ii)	Function… ***Clearance for blade, prevent sticking…***	**2 marks**
16.	(i)	Name of hinge… ***Piano Hinge*** 	**3 marks**
	(ii)	Advantage over Butt hinge… ***Stronger, longer, easier to fit…***	**2 marks**
17.	(i)	Slope of Dovetail… ***Softwood 1:6 , or 6:1*** ***Hardwood 1:8, or 8:1*** 	**1 x 2 marks** **1 x 1 mark**
	(ii)	Reason… ***Softwoods bruise more easily and therefore require a steeper slope, best practice…***	**2 marks**

18. Design modifications…

Restrict overhang, enlarge base, shorten length, prevent movement, reduce light section…

1 x 3 marks
1 x 2 marks

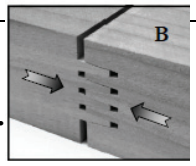
19. (i) Stronger joint…



B

3 marks

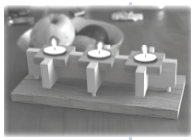
(ii) Reason…



More gluing area, interlocking fingers, side grain better for gluing, resists torsion…

2 marks

20. Cutting list…



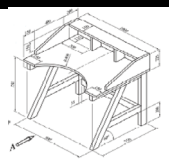
Description	Quantity	Length	Width	Thickness
Base	1	**250**	110	15
Long Rail	1	230	40	**12**
Short Rail	3	90	**40**	12
Candle Base	3	**50**	50	12
Dowels	**4**	30	ø6	

5 x 1 mark

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

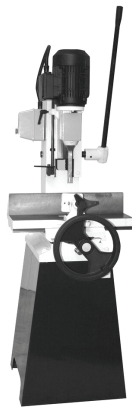
SECTION B

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

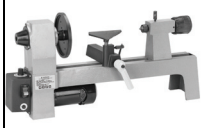
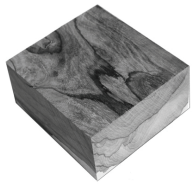
QUESTION	ANSWER	MARKS	
1.	Preparation of working drawing … 		
(i)	**Elevation -**		
	***Setting out overall height (975) width (1000)***	**2 x 1 mark**	
	Showing thickness of top(25)	**1 mark**	
	Position, and thickness of writing surface (25)	**2 x 1 mark**	
	Thickness of top side panel and edge(150)	**2 x 1 mark**	
	Position and thickness of dividers (25)	**2 x 1mark**	
	Showing either edge of curve inset	**1 mark**	
	Showing position and thickness of legs (40)	**2 x 1 mark**	
	Showing cross section of either top rail (75x40)	**1 mark**	
	Showing position and width of rail (75)	**2 x 1 mark**	**15**
(ii)	**Plan -**		
	Setting out/transferring overall width (1000) and depth (750)	**2 x 1 mark**	
	Thickness of top side panels (25) and edge (200)	**3 x 1 mark**	
	Showing width of top (150)	**1 mark**	
	Locating end point of curve, centre and drawing curve	**3 x 1 mark**	**9**
(iii)	**End View -**		
	Setting out/transferring height and depth	**2 x 1 mark**	
	Length width and angle of top panel (600 × 225)	**3 marks**	
	Thickness of writing surface	**1 mark**	
	Width of back leg (75)	**1 mark**	
	Position and width of front leg	**2 marks**	
	Position and width of top rail (675 × 75)	**2 marks**	
	Position and width of bottom rail	**2 marks**	**13**
	General -		
	Scale	**1 mark**	
	Draughtsmanship, presentation…	**2 marks**	**3**
	Note: 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.		

QUESTION	ANSWER	MARKS	
2. (i)	Explanation of steps in design process…  **Investigation/Research -** ***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.***	**5 marks**	
	Evaluation- ***A review of the process of designing and making the artefact where fitness for purpose, appearance, use of materials, modifications, time management, safety and stability are considered.***	**5 marks**	**10**
(ii)	Design solution for wooden storage unit... ***Basic unit/box without any design features (sketch only)***	**6 marks** ↓	
	Fair attempt to store items in an attractive, suitable, portable unit. (Must include notes)	**9 marks** ↓	
	Good, well balanced, well sketched design, showing some innovation and creativity. ***(Must be in 3D and include notes)***	**12 marks** ↓	
	A quality 3D sketch of an original innovative and creative design. The sketch must be rendered or shaded and include relevant notes.	**16 marks**	**16**
(iii)	Incorporation of requirements… ***Portability: handle, lightweight…*** ***Secondary Function: Clock, lamp, drawer…***	**2 + 5 marks** **2 + 5 marks**	**14**

QUESTION	ANSWER	MARKS	
3. (i)	Cross section of tree…  ***A= Bark: Thick corky outer layer, serves to protect tree, prevents evaporation, carries sap from roots to leaves.*** ***B= Cambium Layer: The layer of cells responsible for the growth of the tree.*** ***or*** ***B=Bast/Inner Bark: Carries food to growing parts of the tree*** ***C=Annual Ring: A layer of wood that is formed in one growing season. The age of the tree can be determined by counting the rings*** ***or*** ***C=Heartwood: The inner, more mature, part of the tree responsible for support to the tree.***	**3 x 2 marks** **3 x 2 marks**	**12**
(ii)	Roots, Trunk and Crown… ***Roots: Anchorage, absorb water and minerals, transport...*** ***Trunk : Supports branches, transport, provides timber…*** ***Crown : Generates food, transport, contains leaves…***	**2 + 2 marks** **2 + 2 marks** **2 + 2 marks**	**12**
(iii)	Photosynthesis… ***Water and carbon dioxide, in the presence of sunlight and chlorophyll, cause a chemical reaction to make glucose and oxygen.***	**7 + 5 marks**	**12**
(iv)	Reasons why rain forests should be conserved … ***Protection of habitats, reduction of carbon dioxide levels, aesthetics, rare flora/fauna, prevent silting of watercourses …*** Environmentally friendly use of hardwoods… ***Reuse, recycle hardwoods, use for veneers, Conserving, managing forests…***	**2 x 1 mark** **2 x 1 mark**	**4**

QUESTION	ANSWER	MARKS	
4. (i)	Correct names for woodworking machines... ***W = Sanding Machine, Bench Sander…*** ***X= Router*** ***Y = Pillar Drill*** ***Z = Morticer*** ***Function to be relevant to the machine***	**4 x 2 marks** **4 x 1 mark**	**12**
(ii) 	Setting a morticer... • ***Ensure correct size chisel is inserted*** • ***Place work piece onto table and secure with clamp*** • ***Pull the wheel and turn to adjust the bench until chisel is in correct position.*** • ***Push back in wheel.*** • ***Set depth stop if required.*** • ***Switch on machine and pull handle to insert chisel into wood*** • ***Move timber along by turning wheel pulling handle each time until mortice is complete.*** • ***Rotate piece and repeat process from other side if required***	**2 x 1 marks** **+ 6 marks** **2 x 1 mark**	**10**
(iii)	Three safety precautions... ***Secure work piece,*** ***wear safety goggles,*** ***ensure guard is in place,*** ***remove chuck key before drilling,*** ***set to appropriate speed*** ***read instructions carefully*** ***no loose clothing*** ***tie up long hair*** ***use as instructed…*** ***Reasons***	**3 x 3 marks** **3 x 1 mark**	**12**
(iv) 	Electrical transformer… ***Reduces the risk of serious electric shock, provides better protection in wet conditions, reduces voltage, allows two tools to be used simultaneously…***	**2 x 3 marks**	**6**

QUESTION	ANSWER	MARKS	
5A. (i) 	Cutting the trench… • ***Mark out the required inlay position*** • ***Use cutting gauge to cut both line of the groove*** • ***Cut out the groove with a scratch stock*** ***Or*** • ***Mark out required inlay position*** • ***Insert appropriate router cutter in router*** • ***Set fence to required distance*** • ***Set router depth*** • ***Cut groove with router***	**2 x 3 + 6 marks**	**12**
(ii)	Transfer Ellipse… • ***Tape the 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.***	**2 x 3 marks**	**6**
(iii)	Cutting the veneers… • ***Apply tape to reinforce*** • ***Cut the leaf design accurately in a veneer*** • ***Place this veneer over a selected veneer, ensuring grain is in right direction and cut shape accurately through the gap/window*** • ***Cut ellipse shape*** • ***Fit and tape the cut piece onto the gap*** • ***Apply tape to reinforce*** • ***Place two veneers together and cut ellipse and leaf accurately through both*** • ***Swap shapes and tape together***	**2 x 3 + 6 marks**	**12**
(iv)	Veneer manufacture… ***Rotary Cut, Half Round cut, Flat slicing…*** Process of Manufacture… ***Log is mounted on a lathe*** ***The wood is rotated against a knife/blade*** ***As it rotates a continuous strip of wood is peeled off*** ***A log is placed in a slicing machine*** ***The piece is raised and lowered against the blade to remove veneers***	**2 marks** **2 x 2 + 4 marks**	**10**

QUESTION	ANSWER	MARKS	
5B. (i) 	Lathe parts… ***A- Faceplate: to fix a turning blank*** ***B- Toolrest: to support tools while turning*** ***C- Dead centre, Live centre: to support the end when turning between centres*** ***D- Motor: to drive the headstock***	**4 x 2 marks** **4 x 1 mark**	**12**
(ii)   	Preparing block for turning**...** • ***Find the centre of the block*** • ***Mark out a disk on the block using a compass or template. (disc should be 3-4mm larger than bowl)*** • ***Using an appropriate saw cut out the circle or cut off corners to form an octagon*** • ***Align centre of block with centre of faceplate*** • ***Screw block onto faceplate using appropriately sized screws or temporarily glue block onto faceplate*** Mounting block… • ***Remove drive centre*** • ***Screw block onto faceplate using appropriately sized screws or temporarily glue block onto faceplate*** • ***Screw faceplate onto headstock*** • ***Set up toolrest*** • ***Rotate block by hand making sure its turns freely*** • ***Set lathe rotation to a suitable speed***	**3 x 2 + 2 marks** **3 x 2 + 2 marks**	**16**
(iii)	Suitable speed… ***Low*** Reasons… ***Safety, more control, larger diameter the faster the outside of the piece will move***	**3 marks** **3 marks**	**6**
(iv)	Three safety precautions… ***Wear goggles/visor, secure work piece, use appropriate speed, wear gloves, a dust mask and remove toolrest when sanding, tie back hair , dust extraction…***	**3 x 2 marks**	**6**

Coimisiún na Scrúduithe Stáit
State Examinations Commission

H

Materials Technology Wood - Practical Coursework 2014

Marking Scheme - Higher Level

200 Marks

School: ---------- ***School No:*** ----------

Examiner: ----------

			Folio						Realisation							
Project Choice (1,2, 3 or 4)	**Gender (M or F)**	**Marks**	**10**	**10**	**20**	**20**	**10**	**70**	**20**	**10**	**20**	**40**	**20**	**20**	**130**	**200**
		Examination Number	Analysis of Brief	Investigation/Research	Design ideas/Solution	Sketches/Working Drawings	Evaluation	**Folio Total**	Fitness for purpose	Appropriate use of materials	Creativity	Demonstration of skills	Quality of finish	Overall appearance	**Realisation Total**	**Grade** / **Grand Total**