L-Università ta' Malta

MATSEC
Examinations Board

Marking Scheme

SEC Engineering Technology Unit 1

Main Session 2026

10th May 2024

Marking schemes published by the MATSEC Examination Board are not intended to be standalone documents. They are an essential resource for markers who are subsequently monitored through a verification process to ensure consistent and accurate application of the marking scheme.

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 the MATSEC Examinations Board when in doubt.

Criteria Reference	The student should be able to:	Question Number	Maximum marks that can be achieved	Allocation of marks NOT to be subdivided any further than indicated below	Examples of expected answer.
		Q1	**4**		
K-2	MQF 1: Match safety sign colours with their purpose.	1a	1	0.25 marks for each correct match.	Candidates are expected to match the following sign colours with their purpose: Warning sign – Yellow First aid sign – Green Danger sign - Red Mandatory sign – Blue
	MQF 2: Name the given safety signs.	1b	1	0.2 marks for each correct answer.	Candidates are expected to name the following safety signs: i. Eye wash ii. First aid iii. General danger iv. Do not extinguish with water v. No smoking
	MQF 3: Identify suitable safety signs for a given scenario.	1c	2	0.5 marks for each correct answer.	Candidates are expected to identify **FOUR** suitable safety signs. Examples of correct answers: Safety helmet must be worn Safety overalls must be worn Emergency exit No access for unauthorised persons Order is not important. Any other suitable answer is to be accepted.
		Q2	**4**		
	MQF 1: Identify the different forms of supply of metal.	2a	1	0.25 marks for each correct answer.	Candidates are expected to identify **FOUR** forms of supply of metal. i. Extrusions ii. Wire iii. Bar iv. Forging, or other suitable answers

Criteria Reference	The student should be able to:	Question Number	Maximum marks that can be achieved	Allocation of marks NOT to be subdivided any further than indicated below	Examples of expected answer.
K-4	MQF 2: Outline the properties of different metals.	2b	1	0.25 marks for each property outlined.	Candidates are expected to outline **TWO** different properties for Carbon Steel and Copper. Example of a good outline of the properties of Carbon Steel: Carbon steel has low resistance to environmental degradation and would require regular maintenance. Any other suitable answer is to be accepted.
	MQF 3: Describe the form of supply and type of metal used for a given scenario.	2c	2	1 mark for each correct description of the type of metal used including a reason. 1 mark for each correct description of the form of supply including a reason.	Candidates are expected to describe the type of metal and form of supply for a metallic window shield. Example of correct answers: **Wrought iron rods** can be used to construct the window shield. This metal is ductile and malleable making it easy to bend and form the required shapes. The upper metallic spades can be **moulded** so as to ensure that all the spades are identical and provide a symmetric overall result. This would be idle when multiple window shields are installed on the same façade. Any other suitable answer is to be accepted. N.B no marks are given if not linked to scenario.

Criteria Reference	The student should be able to:	Question Number	Maximum marks that can be achieved	Allocation of marks NOT to be subdivided any further than indicated below	Examples of expected answer.
		Q3	**4**		
K-5	MQF 1: List the different forms of supply of wood.	3a	1	0.25 marks for each correct answer.	Candidates are expected to list any **FOUR** from the following: Planks, Sheets, Dowels, Mouldings, Beams.
	MQF 2: Outline the properties of different wood.	3b	1	0.25 marks for each property outlined.	Candidates are expected to outline **TWO** different properties for red deal and Beech. Example of a good outline for Red Deal: Red deal has high wear resistance and can take repetitive shock loads. Any other suitable answer is to be accepted.
	MQF 3: Describe the form of supply and type of wood used for a given scenario.	3c	2	1 mark for each correct description of the type of wood used including a reason. 1 mark for each correct description of the form of supply including a reason.	Candidates are expected to describe the type of wood and form of supply for the wooden napkin holder. Examples of correct answers: The wooden napkin holder shall be medium to light weight, have good strength, durability and elasticity. A good candidate for wooden napkin holder is Pine, owing its properties match the properties described above. Thick sheets are required to manufacture the wooden base of the napkin holder. Sheets allow to cut the required size based on the dimensions of the base. Any other suitable answer is to be accepted.

Criteria Reference	The student should be able to:	Question Number	Maximum marks that can be achieved	Allocation of marks NOT to be subdivided any further than indicated below	Examples of expected answer.
		Q4	**6**		
C-2	MQF 1: Outline the different tests that can be carried out on materials.	4a	2	1 mark for each correct outline.	Candidates are expected to outline the following **TWO** tests: Shear and Environmental Degradation. Example of correct answer: Shear Test During a shear test a lateral force is applied parallel to the cross-sectional area of the specimen. Shear is calculated based on the applied force and the displacement or deformation of the specimen. Any other suitable answer is to be accepted.
	MQF 2: Explain the test needed to examine a particular property of a given material.	4b	2	1 mark for naming the test. 1 mark for explaining the test.	Candidates are expected to explain the test needed to examine the hardness of iron. Hardness test A hardness test measures the resistance to deformation to indicate a material strength and durability. Hardness tests are assessed through indentation tests. During such tests a hardened steel ball is pressed into a material surface with a known force. The resulting indentation diameter is measured and the hardness of the material is calculated using a hardness formula. Any other suitable answer is to be accepted.
	MQF 3: Justify a test to be carried out to select a particular material for a given scenario.	4c	2	Award 2 marks for a correct justification.	Candidates are expected to justify a test required to ensure that the connection of metal water pipes is according to the defined torque: A torque test can be used to justify the material selected for the bolt and nut in terms of twisting force. The torque test will guarantee that the material will not fail during tightening at the manufacturers recommended torque setting. Any other suitable answer is to be accepted.

Criteria Reference	The student should be able to:	Question Number	Maximum marks that can be achieved	Allocation of marks NOT to be subdivided any further than indicated below	Examples of expected answer.
		Q5	**6**		
C-3	MQF 1: Identify the different manufacturing processes of different materials.	5a	2	0.5 mark for each identified manufacturing process.	Candidates are expected to identify the following: Metal: hardening; galvanising. Polymers: line bending; casting.
	MQF 2: Describe the steps involved in a manufacturing process of a particular material.	5b	2	0.5 marks for each correct step.	Candidates are expected to describe the **FOUR** steps involved in bending wood in the correct order. Example of correct steps: Step 1: Set up an enclosed steam box that is supplied with steam from one end and an exit outlet from another. Step 2: Set up the shaped holder to the required form. Hold at this temperature for 1 hour/inch of thickness Step 3: Insert the wood in the steam box and let the wood steam for 20 minutes per 1cm of thickness. Step 4: Remove the wood from the box and place the steamed wood in the form to produce the required bend. Any other suitable answer is to be accepted.
	MQF 3: Explain the reason behind the different manufacturing processes of a particular material.	5c	2	1 mark for each correct answer.	Candidates are expected to explain the reason behind the manufacturing process of metals: annealing and electroplating Example of a correct answer: Annealing: The annealing process involves heating the metal to a specific temperature using a furnace or oven and then slowly cooling it in a controlled environment. This process is widely used in industry to enhance mechanical properties by increasing ductility and reduces brittleness to the desired level. Any other suitable answer is to be accepted.

Criteria Reference	The student should be able to:	Question Number	Maximum marks that can be achieved	Allocation of marks NOT to be subdivided any further than indicated below	Examples of expected answer.
		Q6	**4**		
K-7	MQF 1: Identify different measuring and marking out tools.	6a	1	0.2 marks for each correct answer.	Candidates are expected to identify the following tools: 1. Combination Square 2. Engineering/ Try square 3. Centre punch 4. Scribing block 5. Protractor
	MQF 2: Outline the functions of different measuring and marking out tools.	6b	1	0.5 marks for each correct outline of function.	Candidates are expected to outline the functions of sliding bevel and centre square. Example of a correct answer: Sliding bevel: A sliding bevel is an adjustable gauge used for both laying out and transferring angles. Any other suitable outline of the functions is to be accepted. Do **not** award marks for a description of tools without reference to their function.
	MQF 3: Choose the appropriate measuring and marking out tools for a specific task/s.	6c	2	0.5 marks for each correct answer.	Candidates are expected to choose **TWO** measuring tools and **TWO** marking out tools. Measuring tools: • Steel Ruler • Micrometer Marking out tools: • Marking knife • Callipers Any other suitable answer is to be accepted.

Criteria Reference	The student should be able to:	Question Number	Maximum marks that can be achieved	Allocation of marks NOT to be subdivided any further than indicated below	Examples of expected answer.
		Q7	**6**		
C-4	MQF 1: Describe different methods of joining materials together.	7a	2	1 mark for each correct description.	Candidates are expected to describe given joining methods. Example of a correct description: Plastic Welding: Plastic welding is the process of creating molecular bonds between two or more compatible thermoplastics. Through this process two or more edges are heated, pressed together and left to cool in the desired position until they merge together. Any other suitable answer is to be accepted.
	MQF 2: Select the ideal joining method for different scenarios.	7b	2	1 mark for each correct answer.	Candidates are expected to select the ideal joining method for the given scenarios: i. Wooden joints ii. Plastic adhesive Any other suitable answer is to be accepted.
	MQF 3: Justify the ideal joining methods for different scenarios.	7c	2	1 mark for each correct justification.	Candidates are expected to justify the ideal joining methods for the given scenarios. Example of a correct answer: Metal welding is ideal to be used to weld the thick metal sheets for the bottom of the ship. Welding has the ability to join thick metals through a very strong bond allowing such joint to withstand without any leak the huge stresses experienced by the ship during storms. Most importantly, welding creates water and oil-tight joints essential for the ship to remain afloat. Welding is permanent, robust, durable and results in good finish. Any other suitable answer is to be accepted.

Criteria Reference	The student should be able to:	Question Number	Maximum marks that can be achieved	Allocation of marks NOT to be subdivided any further than indicated below	Examples of expected answer.
		Q8	**4**		
K-10	MQF 1: Identify assembly and finishing tools.	8a	1	0.2 marks for each correct answer.	Candidates are expected to identify the following finishing tools: 1. Paint brush 2. Sander 3. Screw drivers 4. Spray gun 5. Spanners
	MQF 2: Relate assembly and finishing tools to specific tasks.	8b	1	0.2 marks for each correct answer.	Examples of correct answers: 1. Paint brush –used to apply a coat of paint on a material surface to produce a smooth finish with the desirable colour. 2. Sander – a tool used to cleaning, smoothing and polishing a surface in preparation for finishing. 3. Screw drivers – a hand tool used for insertion and removal of screws. 4. Spray gun – a tool used to spray paint or varnish using air pressure. 5. Spanners – a hand-held tool that provides grip to tighten or loosen bolts and nuts. Any other suitable answer is to be accepted.

Criteria Reference	**The student should be able to:**	**Question Number**	**Maximum marks that can be achieved**	**Allocation of marks NOT to be subdivided any further than indicated below**	**Examples of expected answer.**
	MQF 3: Describe preventive measures when using assembly and finishing tools and equipment.	8c	2	0.5 marks for each correct description.	Candidates are expected to describe **FOUR** preventive measures from the following: i. Remove long hair and jewellery ii. Visual inspection of tool iii. Use suitable tool for the proper job iv. Work to laid down procedures v. Wear appropriate PPE vi. Remove loose clothing Example of a correct description: It is essential to tie back long hair tight to the head and remove dangling jewellery to eliminate the risk of getting tangled with that assembly and finishing tools and equipment.