



L-Università
ta' Malta

MATSEC
Examinations Board



Marking Scheme

SEC Engineering Technology Unit 1

Main Session 2024

17th May 2022

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.

Marking Scheme (Main Session 2024): SEC Engineering Technology Unit 1

Criteria Reference	The student should be able to:	Question Number	Maximum marks that can be achieved	Allocation of marks	Examples of expected answer.
K-2	MQF 1: Match safety sign colours with their purpose.	1a	1	0.25 marks for each correct match.	Mandatory sign – Blue No danger sign – Green Warning sign – Yellow Danger sign - Red
	MQF 2: Name the given safety signs.	1b	1	0.2 marks for each correct answer.	i. Eye protection must be worn ii. No smoking iii. First Aid iv. Do not extinguish with water v. General Danger
	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: No access for unauthorised persons Safety helmet must be worn Safety overalls must be worn Danger of electrocution Order is not important. Any other suitable answer is to be accepted.
	MQF 1: Identify the different forms of supply of metal.	2a	1	0.25 marks for each correct answer.	i. Bar ii. Extrusions iii. Wire iv. Moulding

Marking Scheme (Main Session 2024): SEC Engineering Technology Unit 1

K-4	MQF 2: Outline the properties of different metals.	2b	1	0.25 marks for each property outlined.	<p>Candidates are expected to outline TWO different properties for lead and copper.</p> <p>Properties of Lead:</p> <ul style="list-style-type: none"> • heavy • malleable • very soft • poor conductor <p>Example of a good outline: Lead is a very soft material. It is also very heavy when compared to other materials.</p> <p>Any other suitable answer is to be accepted.</p>
	MQF 3: Describe the form of supply and type of metal used for a given scenario.	2c	2	<p>1 mark for each correct description of the type of metal used.</p> <p>1 mark for each correct description of the form of supply.</p>	<p>Examples of correct answers:</p> <p>Stainless steel can be used to construct the railing. This material is strong, corrosion resistant and aesthetically pleasing thus making it ideal to be used for long-lasting structures near sea-water. Stainless steel maintains its attractive appearance without needing too much maintenance.</p> <p>Both pipes and solid rods can be used for the horizontal railings, while for the hand rail a square section is to be used. For the uprights, a solid flat bar is to be used. This is to be cut and joined to the required shape accordingly.</p> <p>Any other suitable answer is to be accepted.</p> <p>N.B no marks are given if not linked to scenario.</p>

Marking Scheme (Main Session 2024): SEC Engineering Technology Unit 1

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 beech and mahogany. Examples of correct answers: Beech: <ul style="list-style-type: none"> - Hard and tough - High abrasion resistance. Example of a good outline: Beech wood is hard and tough as a material. 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. 1 mark for each correct description of the form of supply.	Examples of correct answers: The type of wood to be used for a chopping board should be hard, tight-grained, long lasting and durable wood example oak. Oak has a nice appearance and is also resistant to fungal attacks. The form of supply of wood required in this scenario is thick sheets. This is such that the chopping board can be easily cut from the sheet to the required dimensions. Any other suitable answer is to be accepted.

Marking Scheme (Main Session 2024): SEC Engineering Technology Unit 1

C-2	MQF 1: Outline the different tests that can be carried out on materials.	4a	2	1 mark for each correct outline.	<p>Hardness Test</p> <p>A hardness test is typically performed by pressing an indenter into the surface of the material to determine the resistance of the material to permanent deformation. The size of the indentation is measured. The larger the indentation, the softer the material.</p> <p>Any other suitable answer is to be accepted.</p>
	MQF 2: Explain the test needed to examine a particular property of a given material.	4b	2	<p>1 mark for naming the test.</p> <p>1 mark for explaining the test.</p>	<p>Environment Degradation test</p> <p>Environmental degradation testing can be carried out in an environmental chamber, which is an enclosure used to test the effects of specified environmental conditions. Conditions may include: extreme temperatures, moisture or relative humidity, rain, weathering and exposure to sun.</p> <p>Any other suitable answer is to be accepted.</p>
	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.	<p>Tensile Test is a test to determine the mechanical properties of structural materials. The specimen material is pulled by tensile load at a constant rate until it fractures. During the test, the tensile load and the elongation of the specimen are monitored and recorded. Many properties can be determined from the tension test such as elastic modulus, strength and ductility, thus making this test useful to select the metal required for this application.</p> <p>Any other suitable answer is to be accepted.</p>

Marking Scheme (Main Session 2024): SEC Engineering Technology Unit 1

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: vacuum forming; line bending.
	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 steps included in the process given. Example of correct answers: Melt the polymer until it is liquid Pressure to force the liquid into a tightly closed mould Allow the polymer to take the shape of the mould Open the mould and pull the object out. 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 different manufacturing processes. Example of a correct answer: Electroplating: Electroplating is the process of plating one metal onto another by hydrolysis, most commonly for decorative purposes or to prevent corrosion of a metal. Electroplating allows manufacturers to use inexpensive metals such as steel or zinc for most of the product and then apply different metals on the outside to account for appearance, protection, and other properties desired for the product. Any other suitable answer is to be accepted.

Marking Scheme (Main Session 2024): SEC Engineering Technology Unit 1

K-7	MQF 1: Identify different measuring and marking out tools.	6a	1	0.2 marks for each correct answer.	<ol style="list-style-type: none"> 1. Vernier Calliper 2. Scriber/Marking knife 3. Chalk line 4. Protractor 5. Engineering/Try square
	MQF 2: Outline the functions of different measuring and marking out tools.	6b	1	0.5 marks for each correct outline of function.	<p>Candidates are expected to outline the functions of micrometre and centre punch.</p> <p>Example of a correct answer: Centre Punch: A centre punch is used to mark the centre of a point. It is usually used to mark the centre of a hole and is used to guide the tip of the driller when drilling holes.</p> <p>Any other suitable outline of the function is to be accepted.</p> <p>Do not award marks for a description of tools without reference to their function.</p>
	MQF 3: Choose the appropriate measuring and marking out tools for a specific task/s.	6c	2	0.5 marks for each correct answer.	<p>Measuring tools:</p> <ul style="list-style-type: none"> • Measuring tape • Engineering/Try square <p>Marking out tools:</p> <ul style="list-style-type: none"> • Marking knife/Scribe • Dividers/Callipers <p>Any other suitable answer is to be accepted.</p>

Marking Scheme (Main Session 2024): SEC Engineering Technology Unit 1

C-4	MQF 1: Describe different methods of joining materials together.	7a	2	1 mark for each correct description.	<p>Candidates are expected to describe given joining methods.</p> <p>Example of a correct description: Bolts and Nuts: The bolt consists of a head and a cylindrical body with screw threads along a portion of its length. The nut is the female member of the pair, having internal threads to match those of the bolt. Bolts and nuts are used to hold two objects, often made of metal or wood, in a fixed position relative to one another.</p> <p>Any other suitable answer is to be accepted.</p>
	MQF 2: Select the ideal joining method for different scenarios.	7b	2	1 mark for each correct answer.	<p>Examples of correct answers: i. Welding ii. Wood adhesive</p> <p>Any other suitable answer is to be accepted.</p>
	MQF 3: Justify the ideal joining methods for different scenarios.	7c	2	1 mark for each correct justification.	<p>Candidates are expected to justify the ideal joining methods for the given scenarios.</p> <p>Example of a correct answer: Bolts and nuts can be used to join two metal beams together. The installation would be smooth and reliable when fitted with properly sized bolts and nuts (mating bolt and nut). The bolts and nuts are simple to install and uninstall as they do not require any heat treatment. They are also corrosion-resistant, inexpensive, and easily available.</p> <p>Any other suitable answer is to be accepted.</p>
K-10	MQF 1: Identify assembly and finishing tools.	8a	1	0.2 marks for each correct answer.	<p>Candidates are expected to identify the following finishing tools:</p> <ol style="list-style-type: none"> 1. Sander 2. Paint brush 3. Spray gun 4. Spanner 5. Screwdriver

Marking Scheme (Main Session 2024): SEC Engineering Technology Unit 1

	MQF 2: Relate assembly and finishing tools to specific tasks.	8b	1	0.25 marks for each correct answer.	<p>Examples of correct answers:</p> <ol style="list-style-type: none"> 1. Sander – portable power tool used to smooth, polish or clean surfaces. It can be used on wood, metal and plastics. 2. Paint Brush – used to apply paint. It is available in various sizes, shapes and materials. 3. Spray gun – used to apply paints with the help of compressed air. Paint is sprayed through this tool, helping in painting large surfaces such as automobiles and furniture. 4. Spanner – used to turn nut and bolt to join two pieces of metal. 5. Screwdriver – this tool has a handle and a shaft. It is used to drive screws in materials. <p>Any other suitable answer is to be accepted.</p>
	MQF 3: Describe preventive measures when using assembly and finishing tools and equipment.	8c	2	0.5 marks for each correct description.	<p>Candidates are expected to describe FOUR preventive measures from the following:</p> <ol style="list-style-type: none"> i. Wear appropriate PPE ii. Use suitable tool for the proper job iii. Visual inspection of tool iv. Work to laid down procedures v. Remove loose clothing vi. Remove long hair and jewellery <p>Example of a correct description: When working with assembly and finishing tools, the correct PPE should be used. This will help in preventing and controlling hazardous situations. It also gives extra protection in the event of an accident.</p>