L-Università ta' Malta

MATSEC
Examinations Board

# Marking Scheme

SEC Engineering Technology Unit 1

**Main Session 2023**
**20th May 2021**

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** | **Examples of expected answer.** |
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| K-2 | MQF 1: Match safety sign colours with their purpose. | 1(a) | 1 mark | 0.25 marks for each correct match. | Warning Sign – Yellow<br>Prohibition Sign – Red<br>Emergency Escape Sign – Green<br>Mandatory Sign – Blue |
| | MQF 2: Name the given safety signs. | 1(b) | 1 mark | 0.2 marks for each correct answer. | i) Safety overalls must be worn<br>ii) Flammable Material<br>iii) No access for unauthorised persons<br>iv) Emergency Exit<br>v) Overhead load |
| | MQF 3: Identify suitable safety signs for a given scenario. | 1(c) | 2 marks | 0.5 marks for each correct answer. | Candidates are expected to identify **FOUR** suitable safety signs.<br>Examples of correct answers:<br>Eye protection must be worn<br>Safety helmet must be worn<br>Safety overalls must be worn<br>Danger of electrocution<br>Order is not important.<br>Any other suitable answer is to be accepted. |
| | MQF 1: Identify the different forms of supply of metal. | 2(a) | 1 mark | 0.25 marks for each correct answer. | i) Rod<br>ii) Extrusions<br>iii) Sheet<br>iv) Wire |

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| K-4 | MQF 2: Outline the properties of different metals. | 2(b) | 1 mark | 0.25 marks for each correct answer. | Candidates are expected to outline **ONE** different property for each metal.<br>Examples of correct answers:<br>i) Mild steel:<br>• hardness,<br>• ductility,<br>• malleability,<br>• strength,<br>• elasticity,<br>• Susceptible to corrosion.<br><br>ii) Brass:<br>• malleability and ductile,<br>• Good heat and electrical conductivity,<br>• Surface tarnish (corrosion-resistant).<br><br>iii) High Carbon Steel:<br>• High hardness,<br>• strength and wear resistance,<br>• Moderate ductility.<br><br>iv) Stainless steel:<br>• Hard and tough even at high and low temperatures,<br>• Resists wear and corrosion,<br>• Different form affects malleability,<br>• Difficult to cut or file,<br>• High ductility.<br><br>Any other suitable answer is to be accepted. |

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| | MQF 3: Describe the form of supply and type of metal used for a given scenario. | 2(c) | 2 marks | 1 mark – describing the type of metal used.<br>1 mark – describing the form of supply. | Examples of correct answers:<br>The type of metal used is steel. It has hardness, malleable and strength. (1 mark)<br><br>The form of supply required is square steel tubing or hollow section or angle iron (for frame), and steel sheet (for top).<br><br>Any other suitable answer is to be accepted.<br><br>N.B no marks are given if not linked to scenario. |
| K-5 | MQF 1: List the different forms of supply of wood. | 3(a) | 1 mark | 0.2 marks for each correct answer. | Planks, Sheets, Dowels, Mouldings, Beams. |
| | MQF 2: Outline the properties of different wood. | 3(b) | 1 mark | 0.25 marks for each property outlined. | Examples of correct answers:<br>i) Walnut:<br>Tough hardwood. Heavy, hard and resilient. Resistant to warping. Subject to light shrinkage. Good strength. Limited durability when exposed to weather.<br><br>ii) Pine:<br>Light-weight softwood. Good strength and elasticity. Good natural durability except where it is in direct contact with earth and moisture. Blue staining of wood can occur when moisture content is high. Susceptible to dents and scratches.<br><br>Any other suitable answer is to be accepted.<br>Accept any **TWO** for each. |

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| | MQF 3:<br>Describe the form of supply and type of wood used for a given scenario. | 3(c) | 2 marks | 1 mark – type of wood used.<br><br>1 mark – form of supply. | Examples of correct answers:<br><br>The type of wood to be used in a doormat should be suitable for outdoor use and thus is limited to red-deal (redwood) or oak wood.<br><br>The form of supply of wood required in this scenario is planks.<br><br>Reason being:<br>wood strips can be cut easier from wood planks and/or<br>Wood vein is to be taken in consideration when manufacturing<br><br>Any other suitable answer is to be accepted. |
| K-7 | MQF 1:<br>Identify different measuring and marking out tools. | 4(a) | 1 mark | 0.2 marks for each correct answer. | i) Micrometer<br>ii) Divider / Calliper<br>iii) Steel Ruler<br>iv) Mortise Gauge<br>v) Centre Punch |
| | MQF 2:<br>Outline the functions of different measuring and marking out tools. | 4(b) | 1 mark | 0.5 marks for each correct outline of functions. | i) Measuring Tape:<br>It is used to quantify the size of an object or the distance between objects.<br><br>ii) Sliding Bevel:<br>Sliding Bevel is a woodworking tool which is used to duplicate and transfer or maintain an angle for cutting timber neatly into surfaces that might not necessarily be at right angles to each other.<br><br>Any other suitable outline of functions is to be accepted.<br>Do not award marks for a description of tools without reference to their function. |

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| | MQF 3:<br>Choose the appropriate measuring and marking out tools for a specific task/s. | 4(c) | 2 marks | 0.25 mark for each correct answer. | i) Vernier Calliper<br>ii) Chalk Line<br>iii) Try Square<br>iv) Scriber<br>v) Centre Punch<br>vi) Steel Ruler<br>vii) Surface Plate<br>viii) Micrometre<br><br>Any other suitable answer is to be accepted. |
| | MQF 1:<br>Describe different methods of joining materials together. | 5(a) | 2 marks | 0.5 marks for each correct description. | i) Nails:<br>Nailing is the quickest way of making a permanent joint in wood. Nails cannot be removed easily or without damage, and therefore should not be used as temporary joints. Nails are typically driven into the workpiece by a hammer or pneumatic nail gun.<br><br>ii) Self-Tapping Screws:<br>Self-tapping screws are fasteners that are designed to drill their own hole as they are screwed into wood, plastic or metal. By using a screw driver and self-tapping screws, precisely fitted threads are created. Self-tapping screws are ideal for items that require regular maintenance and work well when working with two different kinds of material being fastened together.<br><br>iii) Welding:<br>Welding is a material joining process in which two or more parts are assembled (joined together) at their contacting surfaces by a suitable application of heat and/or pressure. Sometimes parts are united together by application of pressure only without external heat. In some welding processes a filler material is added to facilitate the process. Welding is used most commonly with metallic parts but it may also be used with plastics. |

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| C-4 | | | | | iv) Adhesive:<br>The main advantage of using an adhesive over other methods of joining is that it is generally invisible, unlike other methods of joining. Choosing the wrong combination can result in a weak bond or, rarely, damaging the object you meant to repair. One of the most common adhesive application methods are beads and dots. Adhesive beads and dots are usually applied through different dispensing nozzles which allow for precise placing of the dot or bead. The simplest form of a glue dot applicator machine is a hand held squeeze bottle, however in industrial applications other, more advanced equipment is used.<br><br>Any other suitable answer is to be accepted. |
| | MQF 2: Select the ideal joining method for different scenarios. | 5(b) | 2 marks | 0.5 marks for each correct answer. | Examples of correct answers:<br>i) Wooden joint and glue<br>ii) Screw<br>iii) Welding and/or Nut and Bolt<br>iv) Bolt and Nut or Self taping Screws<br><br>Any other suitable answer is to be accepted. |
| | MQF 3: Justify the ideal joining methods for different scenarios. | 5(c) | 2 marks | 1 mark for each correct justification. | Examples of correct answers:<br><br>i) Riveting. A rivet is a permanent mechanical fastener often used on metal sheets. It is widely used in applications where light weight and high strength are critical, such as in aircrafts. The material used for the aircraft fuselage are preferably not welded as deformation and modification of material properties can occur.<br><br>ii) Plastic welding as it is an efficient means of fusing thermoplastic parts using the energy from high-frequency, low-amplitude acoustic vibrations. The entire process takes few seconds (no time for drying and curing). It produces a high-quality permanent bond and a clean, tight seal. This process joins materials without the need for glue or other adhesives or fasteners and therefore saves on production costs.<br><br>Any other suitable answer is to be accepted. |