



**L-Università
ta' Malta**

MATRICULATION AND SECONDARY EDUCATION CERTIFICATE
EXAMINATIONS BOARD

**SECONDARY EDUCATION CERTIFICATE LEVEL
2024 MAIN SESSION**

SUBJECT:	Engineering Technology
PAPER NUMBER:	Controlled – Unit 1
DATE:	17 th May 2022
TIME:	10:00 a.m. to 11:35 a.m.

**THIS PAPER SHOULD BE RETURNED TO THE INVIGILATOR
AFTER THE EXAMINATION.**

Name of candidate _____

I.D. number _____

School _____

Class _____

Answer **ALL** questions in the space provided.

Scenario

- A mechanical manufacturing facility has several types of employees engaged in it.
- Since it is considered as a high-risk facility, health and safety is a top priority.

Question 1

K-2 (4 marks)

Safety signs keep employees aware of potential hazards thus promoting a safe working environment.

a) Match the purpose of each safety sign with its respective colour by drawing a line between them.

Mandatory sign

Red

No danger sign

Yellow

Warning sign

Blue




Danger



Green

(1)

b) Name each of the given safety sign by filling in Table 1 below.

Table 1 – Safety signs.

	Safety Sign	Name
i)		_____ (0.2)
ii)		_____ (0.2)
iii)		_____ (0.2)

	Safety Sign	Name
iv)		_____ (0.2)
v)		_____ (0.2)

(Source: <https://www.vectorstock.com>)

c) Figure 1 below shows a technician working on a machine in a manufacturing plant. Identify **FOUR** suitable safety signs which can be used in this scenario.



Figure 1 – Technician working on a machine.

(Source: <https://engineering.tamu.edu/engineering-online/mechanical.html>)

(2)

Please turn the page.

Question 2

K-4 (4 marks)

Several metals are used in an engineering manufacturing plant. Different metals have different properties and forms of supplies.

a) Identify the different forms of supply of metal given in Table 2 below.

Table 2 – Forms of Metal Supply

	Form of Supply	Name
i)	 <p style="text-align: center; font-size: small;">shutterstock.com · 246007624</p>	<hr style="width: 80%; margin-left: auto; margin-right: 0;"/> <p style="text-align: right;">(0.25)</p>
ii)	 <p style="text-align: center; font-size: small;">shutterstock.com · 143718016</p>	<hr style="width: 80%; margin-left: auto; margin-right: 0;"/> <p style="text-align: right;">(0.25)</p>
iii)	 <p style="text-align: center; font-size: small;">shutterstock.com · 1775541329</p>	<hr style="width: 80%; margin-left: auto; margin-right: 0;"/> <p style="text-align: right;">(0.25)</p>
iv)	 <p style="text-align: center; font-size: small;">shutterstock.com · 129976346</p>	<hr style="width: 80%; margin-left: auto; margin-right: 0;"/> <p style="text-align: right;">(0.25)</p>

Source: <https://shutterstock.com/>

b) Outline **TWO** different properties for each of the metals given below.

Type of metal: Lead

Property 1: _____
_____ (0.25)

Property 2: _____
_____ (0.25)

Type of metal: Copper

Property 1: _____
_____ (0.25)

Property 2: _____
_____ (0.25)

c) Describe **ONE** type of metal and **ONE** form of supply needed to construct the railing of the metal bridge shown in Figure 2 below. Note that the metal bridge will be used near the sea. In your description, include a reason for using the form of supply and the type of metal chosen for this scenario.



Figure 2 – Metal bridge.
(Source: <https://shutterstock.com/>)

c) Describe the form of supply and type of wood needed to construct a chopping board as shown in Figure 3 below. In your answer, include a reason for using such form of supply and type of wood.



Figure 3- Wooden Chopping Board.
(Source: <https://shutterstock.com/>)

(2)

Question 4 **C-2 (6 marks)**

Different testing procedures can be carried out on materials to check their suitability for different applications.

a) Outline the tests given below:

Hardness Test

(1)

This question continues on next page.

Question 5

C-3 (6 marks)

Different manufacturing processes are used to produce a product from raw materials.

a) i) Identify **TWO** metal manufacturing processes. Underline the appropriate answers.

galvanising vacuum forming hardening seasoning

ii) Identify **TWO** polymer manufacturing processes. Underline the appropriate answers.

electro plating vacuum forming line bending galvanising

b) Describe the steps involved in making polymer grooved rings to hold aircraft instruments in position using injection moulding.

(2)

c) Explain the reason behind annealing and electroplating when manufacturing a metallic object.






(2)

Question 6

K-7 (4 marks)

a) Identify the measuring and marking out tools given in Table 3 below.

Table 3 – Measuring and marking out tools.

Measuring and Marking Out Tool	Name
	<p>_____</p> <p>(0.2)</p>
	<p>_____</p> <p>(0.2)</p>
	<p>_____</p> <p>(0.2)</p>
	<p>_____</p> <p>(0.2)</p>
	<p>_____</p> <p>(0.2)</p>

(Source: <https://shutterstock.com/>)

b) Outline the functions of the following measuring and marking out tools.

Micrometre: _____

_____ (0.5)

Centre punch: _____

_____ (0.5)

c) Choose **TWO** appropriate measuring tools and **TWO** marking out tools to construct the wooden chopping board shown in Figure 4.



Figure 4– Wooden Chopping Board.
(Source: <https://shutterstock.com/>)

_____ (2)

Please turn the page.

Question 7

C-4 (6 marks)

Different materials can be joined using different joining methods.

a) Describe the following methods of joining materials together.

Rivets: _____

_____ (1)

Bolts and Nuts: _____

_____ (1)

b) Select the ideal joining method for the following scenarios.

i) Permanently join the plastic making up the front and back case of a car key.
_____ (1)

ii) Permanently join two pieces of wood to form the corner of a wooden frame.
_____ (1)

c) Justify an ideal joining method for each of the following scenarios:

Scenario 1: Joining two metal beams perpendicular to each other.

(1)

Scenario 2: Add shelves inside a wooden cabinet.

(1)

Please turn the page.



Question 8

K-10 (4 marks)

A product should be assembled and finished off according to a given specification. There are several assembly and finishing tools that can be used for this task.

- a) Identify the assembly and finishing tools given in Table 4 below. (1)
- b) Relate each tool to a specific task which it can be used for. (1)

Table 4 – Assembly and finishing tools

Assembly and Finishing Tools	(a) Name	(b) Specific task for which tool can be used
		
		
		
		
		

(Source: <https://shutterstock.com/>)

c) Describe **FOUR** preventive measures when using assembly and finishing tools and equipment.

(2)

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