



**L-Università
ta' Malta**

MATRICULATION AND SECONDARY EDUCATION CERTIFICATE
EXAMINATIONS BOARD

**SECONDARY EDUCATION CERTIFICATE LEVEL
2023 MAIN SESSION**

SUBJECT:	Engineering Technology
PAPER NUMBER:	Controlled – Unit 1
DATE:	20 th May 2021
TIME:	10:00 a.m. to 11:35 a.m.

Name of candidate _____

I.D. number _____

School _____

Class _____

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

Scenario

- An aircraft maintenance 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 convey a health and safety message by means of a combination of shape, colour and symbols and/or text.

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

Warning sign	Red
Prohibition sign	Yellow
Emergency escape sign	Blue
Mandatory sign	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: <http://www.whsconsultinghunter.com.au/whs/safety-signage-workplace/>)

- c) Figure 1 below shows aviation powerplant mechanics working on an engine. Identify **FOUR** suitable safety signs which can be used in this scenario.

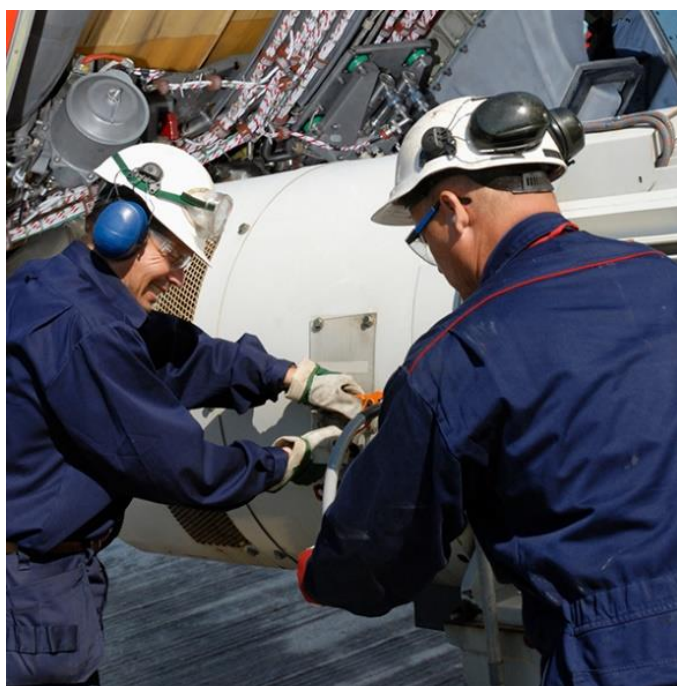


Figure 1 – Aviation powerplant mechanics.

(Source: <https://www.careerinyear.com/miami/aviation-powerplant-mechanics/>)

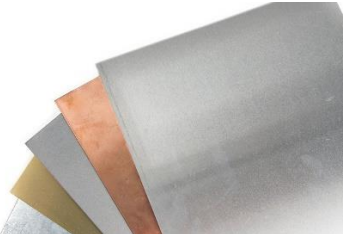
(2)

Question 2**K-4 (4 marks)**

Several materials are used in an engineering maintenance environment. 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)	 (Source: www.indiamart.com)	(0.25)
ii)	 (Source: https://www.gestiondecompras.com/)	(0.25)
iii)	 (Source: https://makezine.com/)	(0.25)
iv)	 (Source: https://www.homedepot.com/)	(0.25)

b) Outline **ONE** different property of each different metal given in Table 3 below.

Table 3 – Properties of Metals

	Metal	Property of metal
e.g.	Cast Iron	Cast iron is resistant to deformation.
i)	Mild Steel	(0.25)
ii)	Brass	(0.25)
iii)	High Carbon Steel	(0.25)
iv)	Stainless steel	(0.25)

This question continues on next page.

- c) Describe the form of supply and type of metal needed to construct the frame and the top of the metal workbench shown in Figure 2 below. In your description, include a reason for using such form of supply and type of metal in this scenario.



Figure 2 – Metal workbench.

(Source: <https://toolguyd.com/rogue-supply-workbench/>)

[illegible]

(2)

Question 3**K-5 (4 marks)**

Wood is also a widely used material and is supplied in various forms. It has different properties and thus is suitable for a range of applications, such as poles, furniture, building structures and instruments.

a) List **FIVE** different forms of supply of wood.

Form of Supply 1: _____ (0.2)

Form of Supply 2: _____ (0.2)

Form of Supply 3: _____ (0.2)

Form of Supply 4: _____ (0.2)

Form of Supply 5: _____ (0.2)

b) Outline **TWO** different properties for the each of the following types of wood:

i) Walnut

Property 1: _____
_____ (0.25)

Property 2: _____
_____ (0.25)

ii) Pine

Property 1: _____
_____ (0.25)

Property 2: _____
_____ (0.25)

This question continues on next page.

- c) Describe the form of supply and type of wood needed to construct a wooden doormat 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 Doormat.

(Source: <https://www.domesticimperfection.com/wooden-welcome-mat/>)

Question 4**K-7 (4 marks)**

Measuring and marking out tools will provide a precise measurement and placement required for any manufacturing project.

a) Identify the measuring and marking out tools given in Table 4 below.

Table 4 – Measuring and marking out tools.

	Measuring and Marking Out Tool	Name
i)		(0.2)
ii)		(0.2)
iii)		(0.2)
iv)		(0.2)
v)		(0.2)

(Source: <https://www.fine-tools.com/mess.html>)

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

i) Measuring Tape:

(0.5)

ii) Sliding Bevel:

(0.5)

c) Choose the appropriate measuring or marking out tools for the following tasks. Each tool can only be used once:

i) Accurately measure the inside and outside diameters of different steel pipes.

(0.25)

ii) Draw a long straight line on a wall to provide an accurate guide for tile laying.

(0.25)

iii) Check if two wood surfaces are at 90° against each other.

(0.25)

iv) Mark a line on a sheet metal before a cutting process.

(0.25)

v) Make a dimple on a metal surface where a hole is to be drilled.

(0.25)

vi) Measure the length of a piece of wood which is less than 30cm long.

(0.25)

vii) Check whether a thin sheet of metal has a flat surface.

(0.25)

viii) Measure the thickness of a wire.

(0.25)

Question 5

C-4 (6 marks)

Different materials can be joined using different joining methods.

a) Describe the following methods used in joining materials together.

i) Nails

(0.5)

ii) Self-tapping Screws

iii) Welding

 (0.5)

iv) Adhesive

(0.5)

b) Select the ideal joining method for the following scenarios. The same method can be used more than once.

i) Permanently joining the sides of a wooden drawer with the front.

 (0.5)

ii) Fitting hinges to wooden doors.

 (0.5)

This question continues on next page.

iii) Joining two metal beams perpendicular to each other.

_____ (0.5)

iv) Joining two pieces of metal which can be disassembled again.

_____ (0.5)

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

Scenario 1: Joining metal sheets to form the fuselage (body) of an aircraft.

Scenario 2: Permanently join two lightweight thermoplastic parts in a production plant.

(2)