



L-Università  
ta' Malta

MATRICULATION AND SECONDARY EDUCATION CERTIFICATE  
EXAMINATIONS BOARD

**SECONDARY EDUCATION APPLIED CERTIFICATE LEVEL  
2022 SUPPLEMENTARY SESSION**

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SUBJECT: **Engineering Technology**  
PAPER NUMBER: Synoptic – Unit 1  
DATE: 1<sup>st</sup> November 2022  
TIME: 8:30 a.m. to 10:35 a.m.

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

**For examiners' use only:**

Question	1	2	3	4	5	6	Total
Score							
Maximum	6	8	8	8	8	12	50

Answer **ALL** questions in the space provided. You may answer either in English or in Maltese.

### Scenario

- A technician who is working in an engineering company, is required to answer the following questions.
- The questions include health and safety aspects.

### Question 1

**K-1 (6 marks)**

a. Name **FOUR** different PPEs (personal and protective equipment).

PPE 1: \_\_\_\_\_ (0.5)

PPE 2: \_\_\_\_\_ (0.5)

PPE 3: \_\_\_\_\_ (0.5)

PPE 4: \_\_\_\_\_ (0.5)

b. Identify **FOUR** different PPEs (personal and protective equipment) required when cutting steel with a grinder on a construction site as shown in Figure 1 below.



Figure 1 – Cutting steel with a grinder on a construction site  
(Source: shutterstock.com)

PPE 1: \_\_\_\_\_ (0.5)

PPE 2: \_\_\_\_\_ (0.5)

PPE 3: \_\_\_\_\_ (0.5)

PPE 4: \_\_\_\_\_ (0.5)

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c. Describe the function of **TWO** PPEs (personal and protective equipment) required when welding.

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**Question 2**

**K-3 (8 marks)**

Alloys and manmade woods are two classes of material.

a. List **FOUR** other different classes of material.

Material Class 1: \_\_\_\_\_ (0.5)

Material Class 2: \_\_\_\_\_ (0.5)

Material Class 3: \_\_\_\_\_ (0.5)

Material Class 4: \_\_\_\_\_ (0.5)

b. Outline **ONE** property for each of the following materials.

Material Class: Alloys

Property: \_\_\_\_\_

\_\_\_\_\_ (1)

Material Class: Manmade woods

Property: \_\_\_\_\_

\_\_\_\_\_ (1)

***This question continues on next page.***

- The table shown in Figure 2 is made out of different materials.
- The top part is made out of wood while the legs are made out of metal.



Figure 2: (Source: <https://www.houzz.com/>)

c. Describe the form of supply of each material used to construct the table.

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**Question 3**

**K-5 (8 marks)**

a. Label the tools and equipment used for cutting material given in Table 1.

Table 1: Cutting tools and equipment.

	<b>Cutting Tools and Equipment</b>	<b>Name</b>
i.	 <p>(Source: <a href="https://www.ubuy.com.tr/">https://www.ubuy.com.tr/</a>)</p>	  <hr/>  <p>(0.5)</p>
ii.	 <p>(Source: <a href="https://albertonhardware.co.za/">https://albertonhardware.co.za/</a>)</p>	  <hr/>  <p>(0.5)</p>
iii.	 <p>(Source: <a href="https://www.amazon.com/">https://www.amazon.com/</a>)</p>	  <hr/>  <p>(0.5)</p>
iv.	 <p>(Source: <a href="https://www.bahco.com">https://www.bahco.com</a>)</p>	  <hr/>  <p>(0.5)</p>

b. Outline the function of the following tools and equipment used for cutting materials:

Craft Knife

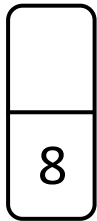
\_\_\_\_\_  
\_\_\_\_\_ (1)

Band saw

\_\_\_\_\_  
\_\_\_\_\_ (1)

c. Describe **FOUR** preventive measures to be taken when using an angle grinder to cut a metal round bar.

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\_\_\_\_\_ (4)







**Question 4**

**K-6 (8 marks)**

a. Identify the tools and equipment used for making non-permanent joints given in Table 2.

Table 2: Tools and equipment for non-permanent joints.

	<b>Tools and equipment for non-permanent joints</b>	<b>Name</b>
i.	 <p>(Source: <a href="https://www.diy.com/">https://www.diy.com/</a>)</p>	<p>_____</p> <p>(0.5)</p>
ii.	 <p>(Source: <a href="https://www.shutterstock.com/">https://www.shutterstock.com/</a>)</p>	<p>_____</p> <p>(0.5)</p>
iii.	 <p>(Source: <a href="https://www.stanleytools.com/">https://www.stanleytools.com/</a>)</p>	<p>_____</p> <p>(0.5)</p>
iv.	 <p>(Source: <a href="https://www.alibaba.com/">https://www.alibaba.com/</a>)</p>	<p>_____</p> <p>(0.5)</p>

b. Outline the function of the following tools and equipment used for making non-permanent joints.

Hammers

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Spanners

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c. Describe **ONE** preventive measure to be taken when using hammers and **ONE** preventive measure to be taken when using spanners.

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**Question 5****K-8 (8 marks)**

a. Identify the finishing tools given in Table 3.

Table 3: Finishing Tools.

	<b>Finishing Tools</b>	<b>Name</b>
i.	 <p>(Source: <a href="https://www.google.com">https://www.google.com</a>)</p>	<p>_____</p> <p>(0.5)</p>
ii.	 <p>(Source: <a href="https://www.google.com">https://www.google.com</a>)</p>	<p>_____</p> <p>(0.5)</p>
iii.	 <p>(Source: <a href="https://www.google.com">https://www.google.com</a>)</p>	<p>_____</p> <p>(0.5)</p>
iv.	 <p>(Source: <a href="https://www.google.com">https://www.google.com</a>)</p>	<p>_____</p> <p>(0.5)</p>

b. Match the following Column A (finishing tools) to Column B (specific task), by drawing a line between Column A and Column B.

Column A (Finishing tools)

Column B (Tasks)



Remove fine amounts of material from a piece of metal



Quickly remove the paint from a wooden beam



Even the surface of a flat wooden railing



Apply paint evenly to a car body panel

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c. Describe the following **TWO** preventive measures to be taken when using finishing tools and equipment.

visual inspection of the tool	wear appropriate PPE
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**Question 6**

**C-2 (12 marks)**

a. Outline the following **FOUR** tests that can be carried out on materials.

Hardness: \_\_\_\_\_  
\_\_\_\_\_ (1)

Environment degradation: \_\_\_\_\_  
\_\_\_\_\_ (1)

Compression: \_\_\_\_\_  
\_\_\_\_\_ (1)

Tensile: \_\_\_\_\_  
\_\_\_\_\_ (1)

b. Explain the test needed to examine the maximum temperature a plastic handle for a heat gun can withstand.

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- A bridge is being built over sea water using steal beams.
- The beams and other individual parts will be bolted together.
- The structural engineer orders environmental degradation test on the bolts.

c. Justify the test chosen to be carried out to select the best material for the bolts.

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