

**SECONDARY EDUCATION CERTIFICATE LEVEL
2025 SUPPLEMENTARY SESSION**

SUBJECT: **Engineering Technology**
PAPER NUMBER: Synoptic – Unit 1
DATE: 4th November 2025
TIME: 11:30 a.m. to 1:35 p.m.

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

For examiners' use only:

Question	1	2	3	4	5	6	7	8	Total
Score									
Maximum	6	8	8	8	8	8	12	12	70

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

Scenario

- A recruitment company has been tasked to assess a number of applicants for a junior technician opening at a local manufacturing company.
- The following test was formulated to assess the knowledge of the applicants.

Question 1

K-1 (6 marks)

a. Identify the personal protective equipment (PPE) illustrated in Table 1 below from the following wordbank.

hard hat	eye protection	protective footwear
harness	hand protection	mask/respirator

Table 1: Personal Protective Equipment.

	PPE	Name
i.		_____ (0.5)
(Source: https://ph.rs-online.com/)		
ii.		_____ (0.5)
(Source: https://www.3m.co.uk/)		
iii.		_____ (0.5)
(Source: https://redasafe.com/)		
iv.		_____ (0.5)
(Source: https://mt.rsdelivers.com/)		

b. List **TWO** personal protective equipment (PPE) that should be worn when drilling a hole in a brick wall using a cordless drill as shown in Figure 1.



Figure 1: Drilling a hole in a brick wall using a cordless drill
(Source: <https://www.facilitiesnet.com/>)

PPE 1: _____ (1)

PPE 2: _____ (1)

c. The machine operator shown in Figure 2 is required to wear a number of PPE including an overall and eye protection besides others.

Describe the function of both the overall and the eye protection in this scenario.

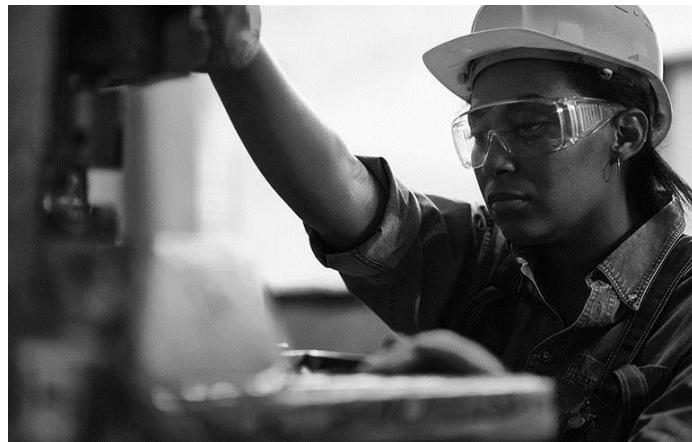


Figure 2: A machine operator working in a manufacturing plant
(Source: <https://www.istockphoto.com/>)

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Question 2

K-3 (8 marks)

a. List **TWO** responsibilities of employers and **TWO** responsibilities of employees according to Act 27 of 2000 Occupational Health and Safety Authority Act.

Responsibilities of Employers 1: _____

(0.5)

Responsibilities of Employers 2: _____

_____ (0.5)

Responsibilities of Employees 1: _____

_____ (0.5)

b. Assign the following **FOUR** scenarios with the given Health and Safety legislations by drawing a line between them. (2)

Scenario	Health and Safety Legislation
Installation of "Emergency Exit" signs.	Legal notice 36 of 2003 General Provisions for Health and Safety at Work Places Regulations
Ensuring that the working areas and corridors are kept clean from unnecessary material.	Legal notice 45 of 2002 Work Places (Provision of Health and/or Safety Signs) Regulations
Ensuring that workers are supplied with all appropriate PPEs.	Legal notice 35 of 2003 Protection against Risks of Back Injury at Work Placement Regulations
Ensure that workers do not carry heavy loads.	Legal notice 121 of 2003 Minimum Requirements for the use of Personal Protective Equipment at Work Regulations

c. • An unsupervised untrained worker was using a grinder in a workshop.
 • He was wrongly using a thin cutting disc to grind a piece of iron bar.
 • All of a sudden the disc broke with parts of the disc penetrating and injuring his hand.

i. Describe **TWO** responsibilities that should have been followed to prevent this injury.

Responsibility 1:

(1)

Responsibility 2:

(1)

This question continues on next page.

ii. Describe how proper adherence to Health and Safety Legislation would have prevented this incident.

8

Question 3

K-5 (8 marks)

a. List **FOUR** different forms of supply of wood.

Form of Supply 1: _____ (0.5)

Form of Supply 2: _____ (0.5)

Form of Supply 3: _____ (0.5)

Form of Supply 4: _____ (0.5)

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

Type of wood: Oak

Property 1: _____

_____ (0.5)

Property 2: _____

Type of wood: Red Deal

Property 1: $\mathcal{L}_1(\mathcal{A}_1, \mathcal{A}_2) \leq \mathcal{L}_1(\mathcal{A}_1, \mathcal{A}_3) + \mathcal{L}_1(\mathcal{A}_3, \mathcal{A}_2)$

(0.5)

Property 2: _____

c. Figure 3 shows a wooden mobile mobile charging stand.



Figure 3: Wooden-based mobile charging stand
(Source: <https://www.amazon.com/>)

i. Describe the form of supply that should be used to manufacture this stand. In your answer, include **ONE** reason for using such type of wood.

(2)

(2)

ii. Describe a wood type that would be ideal to manufacture this mobile stand. In your answer, include **ONE** reason for using such type of wood.

(2)

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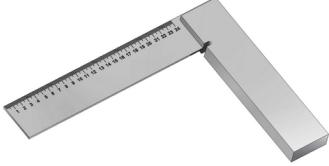
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Question 4**K-7 (8 marks)**

a. Identify the measuring and marking out tools given in Table 2 below.

Table 2: Measuring and marking out tools.

	Measuring and marking out tools	Name
i.	 A digital height gauge with a vertical measuring rod and a digital display. <i>(Source: https://www.starrett.com/)</i>	_____ (0.25)
ii.	 A long, thin, tapered metal tool used for marking centers on workpiece surfaces. <i>(Source: https://www.eis-inc.com/)</i>	_____ (0.25)
iii.	 A semi-circular protractor with markings from 0 to 180 degrees. <i>(Source: https://flaxart.com/)</i>	_____ (0.25)
iv.	 A center punch with a textured grip and a sharp point. <i>(Source: https://mt.rsdelivers.com/)</i>	_____ (0.25)

v.	 <i>(Source: https://www.homedepot.com/)</i>	
vi.	 <i>(Source: https://www.craftsmanspace.com/)</i>	
vii.	 <i>(Source: https://uk.misumi-ec.com/)</i>	
viii.	 <i>(Source: https://no.rs-online.com/)</i>	

b. Outline **ONE** function of each of the following measuring and marking out tools:

Micrometre: _____

 _____ (1)

Surface Plate: _____

 _____ (1)

This question continues on next page.

c. Choose the appropriate measuring and marking out tools for each of the following tasks:

i. To replicate a bolt's diameter and transfer the dimension directly to drill the matching hole size accurately.

_____ (1)

ii. To mark a precise 90° angle on a piece of wood.

_____ (1)

iii. To locate the exact center of a circular or cylindrical object for drilling.

_____ (1)

iv. To measure the length of a table.

_____ (1)

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Question 5

K-9 (8 marks)

a. Identify the different bending and forming tools given in Table 3 below.

Table 3: Bending and forming tools.

	Bending and forming tools	Name
i.	 <i>(Source: https://shorturl.at/v4Pwq)</i>	<hr/> <hr/> <p style="text-align: right;">(1)</p>
ii.	 <i>(Source: https://www.gz-supplies.com/)</i>	<hr/> <hr/> <p style="text-align: right;">(1)</p>

b. Associate the appropriate bending or forming tool required to perform the below tasks from the following tools:

Pipe Bender	Sheet bender	Mallet
Strip wire heater	Vacuum former	

- i. To drive dowels inside a piece of wood.

(0.5)

ii. To bend a metal conduit pipe.

(0.5)

iii. To manufacture plastic lunch boxes.

(0.5)

iv. To permanently seal a plastic bag.

(0.5)

c. Describe the following **TWO** preventive measures that must be taken when using bending and forming tools.

Adopt a good working posture Remove sharp edges

8

(4)

Question 6**K-10 (8 marks)**

In Table 4 below:

a. Identify the assembly and finishing tools. (2)
 b. Relate each tool to **ONE** specific task that the tool can be used for. (2)

Table 4: Assembly and finishing tools

	Assembly and Finishing Tools	a. Name	b. Specific task for which tool can be used
i.	 <i>(Source: https://www.bgstechnic.com/)</i>		<hr/> <hr/> <hr/>
ii.	 <i>(Source: https://tolsen.com.ph/)</i>		<hr/> <hr/> <hr/>
iii.	 <i>(Source: https://www.kincrome.com.au/)</i>		<hr/> <hr/> <hr/>

iv.	 <i>(Source: https://www.harborfreight.com/)</i>		
v.	 <i>(Source: https://www.centurytool.net/)</i>		

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

Visual inspection of the tool Use suitable tools for the proper job	Remove long hair and jewellery Wear appropriate PPE
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Question 7**C-1 (12 marks)**

a. A worker is cutting a piece of iron hollow section using a bandsaw. She is wearing disposable plastic gloves.

Explain **TWO** consequences of not using gloves which are of appropriate design and material.

Consequence 1: _____

(2)

Consequence 2: _____

(2)

b. In a workshop, workers have access to the types of gloves shown in Figure 4 and Figure 5. Explain the purpose of the different functional design and materials of the **TWO** different types.



Figure 4: (Source: <https://www.ncordina.com>)



Figure 5: (Source: <https://www.wellslamontindustrial.com/>)

First Model: Nitrile Disposable Gloves

Functional design:

(1)

Material:

(1)

Second Model: Metal Fabrication Gloves

Functional design:

(1)

Material:

(1)

c. The workers shown in Figure 6, are working in a potentially toxic confined space.
Explain the choice of **TWO** PPE, with regard to their specific design and material being used.



Figure 6: Working in confined spaces
(Source: <https://www.mscdirect.com/>)

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Question 8

C-3 (12 marks)

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

electroplating	bending	casting	galvanising	(2)
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ii. Identify the **TWO** polymer manufacturing processes. Circle the appropriate answers.

annealing	vacuum forming	hardening	moulding	(2)
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b. Describe the **FOUR** steps in the correct order involved in bending wood to be used to create arched door frames.

Step 1: _____

(1)

Step 2: _____

Step 3: _____

c. Explain the reason behind the following manufacturing processes of polymer.

rotational forming

moulding

12

(4)

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