



**L-Università  
ta' Malta**

MATRICULATION AND SECONDARY EDUCATION CERTIFICATE  
EXAMINATIONS BOARD

**SECONDARY EDUCATION CERTIFICATE LEVEL  
2018 SUPPLEMENTARY SESSION**

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SUBJECT:	<b>Engineering Technology</b>
PAPER NUMBER:	Synoptic – Unit 2
DATE:	2 <sup>nd</sup> November 2018
TIME:	10:00 a.m. to 12:05 p.m.

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

**Scenario**

A local company specialising in the production of home and office furniture has recently recruited you as an Engineering Officer. One month before your probation expires you will be requested to sit for an assessment to ensure that you have the right skills and competences for the company to invest further on you. You are requested to answer **ALL** questions to prove your chance of passing this assessment.

**Question 1**

**K1 (6 marks)**

Identify **THREE** different types of metals and describe what makes them different from other metals.

Type 1:

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(2)

Type 2:

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(2)

Type 3:

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(2)

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**Question 2**

**K2 (6 marks)**

Identify **THREE** different types of woods and describe what makes them different from other woods.

Type 1:

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(2)

Type 2:

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(2)

Type 3:

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(2)

**Question 3**

**K3 (4 marks)**

Identify **TWO** different types of polymers and describe what makes them different from each other.

Type 1:

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(2)

Type 2:

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(2)

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**Question 4**

**K6 (6 marks)**

Identify **TWO** different forms of supply for each of the following types of material.

(a) Metals

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(2)

(b) Woods

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(2)

(c) Polymers

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(2)

**Question 5**

**C4 (10 marks)**

For each scenario provided, choose **ONE** appropriate form of supply and justify the choice made.

(a) Metal is to be used to manufacture a 30cm x 30cm x 30cm light box which will be utilised for the storage of small objects.

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(2)

(b) Wood is to be used as the back of a broom cupboard which measures 240cm x 60cm. The cupboard is to be utilised inside a house.

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(2)

(c) Plastic is to be used for injection moulding in manufacturing small plastic toys.

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(2)

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(d) Wood is to be used to construct a small wooden tool room in a garden measuring 300cm x 200cm x 250cm.

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(2)

(e) Metal is to be used for chairs which can withstand someone weighing up to 120kg.

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(2)

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**Question 6**

**K9 (6 marks)**

Employees in manufacturing companies make constant use of different power tools and machinery to perform different tasks. Complete Table 1 by identifying the name of the tool / machinery and outlining **ONE** respective function.

Tool / Machinery	Name	Function
		
		
		
		
		
		

(6)

Table 1 –Names and Functions of Tool/Machinery

**Question 7**

**C2 (10 marks)**

Different manufacturing processes are used to produce goods made up of different materials. Explain the different manufacturing processes listed by providing the number of steps indicated in the brackets.

(a) Metal Process: Galvanising (**FOUR**)

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(4)

(b) Wood Process: Seasoning (**TWO**)

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(2)

(c) Polymers: Injection Moulding (**FOUR**)

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**Question 8**

**K5 (6 marks)**

Different tests can be carried out on materials to determine their properties and current conditions.

(a) Identify **FOUR** different tests that can be carried out on different materials.

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(2)

(b) Outline how **TWO** of the tests identified in (a) are carried out.

Test 1:

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(2)

Test 2:

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(2)



**Question 9**

**A1 (15 marks)**

The company is currently working on the design of new outdoor tables and benches that are to withstand hot summer months and cold winter months. The table and benches, made up of wood and stainless steel, are shown in Figure 1 below.



Figure 1 – Table and benches to be used outside, *taken from www.bestdecorthings.com*

(a) Identify **THREE** tests which are to be carried out on the prototype before starting production of the new furniture.

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(3)

(b) For each test chosen in (a), explain the procedure that is to be carried out.

Test 1:

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(4)

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Test 2:

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(4)

Test 3:

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(4)

**Question 10**

**K10 (6 marks)**

Several tools are used when designing, manufacturing and testing new products. Describe how the tools listed below should be taken care of, to ensure these last longer. For each tool provide **TWO** points which should be considered.

i. Power Drill

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(2)

ii. Vacuum Former

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(2)

iii. Hot Air Blower

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(2)

**Question 11**

**C5 (10 marks)**

A wooden bench, as shown in Figure 2 below, is to be manufactured.



Figure 2- Wooden Bench

(Source: <http://www.pixelmari.com>)

Justify the use of **FIVE** tools required during the manufacturing stages of this bench.

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(10)

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**Question 12****A2 (10 marks)**

The design engineer needs your support to design the face of a box which will be used as a bird nest breeding box, as shown in Figure 3. This face measures 10 cm x 12 cm and has a hole in the middle. The radius of the hole is to be 3 cm. Use the space provided below to mark out this design.



Figure 3 – Bird Nest Breeding Box (Source: [www.birdhousesupply.com](http://www.birdhousesupply.com))

**Question 13**

**A3 (5 marks)**

You are now required to produce a cube made of steel with dimension 40cm x 40cm x 40cm. List **FIVE** tools needed to mark out, measure and produce this 3D finished engineering component.

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