



**TVET CURRICULUM DEVELOPMENT, ASSESSMENT AND CERTIFICATION  
COUNCIL (TVET CDACC)**

**Qualification Code** : 071606T4MCT  
**Qualification** : Mechatronic Technician Level 6  
**Unit Code** : ENG/OS/MC/CC/05/6/A  
**Unit of Competency** : Apply material science principles

**PRACTICAL ASSESSMENT**

**INSTRUCTIONS TO CANDIDATE**

1. In this practical assessment, you are required to perform the following tasks:
  - a. Analyse properties of engineering materials
  - b. Utilise engineering materials
  - c. Perform material testing
2. You will be allocated **3 HOURS** to complete the practical task.
3. The assessor will record your performance at critical points using audio-visual means

**Task:**

- To determine the tensile strength of steel by using UTM and the percentage of elongation of steel.

**Procedure:**

- i. Measurement initial length of the specimen and record your values.
- ii. Load the specimen provided on the machine and strain at a constant rate until it breaks.
- iii. Using appropriate conversion factors and specimen area and gauge length obtain engineering stress-strain curve.
- iv. Record measurement of the final length of the specimen and ultimate load.

**OBSERVATION AND CALCULATION: -**

Sample Diameter	Initial length - $L_o$ (mm)	Final length - $L_f$ (mm)	Ultimate load (kN)	% of elongation
10				

**CALCULATION: -**

For tensile strength:

Maximum load taken by 10 mm for the sample = \_\_\_\_\_ kN

Calculated cross section area of the sample = \_\_\_\_\_  $mm^2$

Tensile strength, TS =  $\frac{\text{Max load taken by the sample}}{\text{Cross section area of specimen}}$  = \_\_\_\_\_  $N/mm^2$

**RESULTS**

From the graph generated;

- i. Determine the mechanical properties of the tested material.
- ii. Determine the elastic limit (limit of proportionality)

- iii. Determine the upper yield point
- iv. Determine the ultimate tensile stress. Compare the value with the calculated value.

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