

071906T4AEN

AGRICULTURAL ENGINEERING LEVEL 6

ENG/OS/AGR/CC/02/6/A

PERFORM WORKSHOP PROCESSES AND MATERIALS

July/August 2024



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

WRITTEN ASSESSMENT

3 HOURS

INSTRUCTIONS TO CANDIDATE

1. This paper consists of two sections; **A** and **B**
2. Answer **ALL** the questions as guided in each section
3. Marks for each question are as indicated in the brackets
4. You are provided with a separate answer booklet to answer the questions
5. Do not write in this question paper

This paper consists of THREE (3) printed pages

Candidates should check the question paper to ascertain that all pages are printed as indicated and that no questions are missing

SECTION A: (40 Marks)

Answer all questions in this section

1. When working in the workshop it is important to observe safety rules and practices to prevent injuries and accidents. State **four** safety rules to be observed when working in the workshop. (4 marks)
2. Outline the process of drilling a round hole on a work piece. (4 marks)
3. Gas cutting is a common method used to cut and shape metals with the help cutting torches. Explain the principle of gas cutting. (4 marks)
4. Cutting fluids are liquids or oils used during machining operations.
 - a) Identify **three** functions of cutting fluids. (3 marks)
 - b) List **three** factors to be considered when selecting a suitable cutting fluid. (3 marks)
5. Soldering is a welding process used to join metal components together by melting a filler metal in between the joint to form strong bond. Outline **two** defects found in soldered joints.(2 marks)
6. Define the following tool angles; (4 marks)
 - i. Clearance angle
 - ii. Rake angle
7. Illustrate the features of a twist drill. (4 marks)
8. Define the following terms; (4 marks)
 - i. Malleability
 - ii. Ductility
 - iii. Hardness
 - iv. Toughness.
9. Illustrate the following tools indicating the material each is made of; (4 marks)
 - i. Reamer
 - ii. Ball pein hammer
10. Outline **two** classes of files according to type of cut. (4 marks)

SECTION B (60 Marks)

Answer any **THREE** questions in this section

11.

- a) Explain how acetylene gas is safely recharged. (3marks)
- b) Draw a sectional view of a welding torch and label the parts. (7 marks)
- c) With the aid of sketches, highlight the movement and the direction of the welding torch and the filler rod;
 - i. Leftward technique (5 marks)
 - ii. Rightward technique (5 marks)

12.

- a) Explain **four** types of costs incurred in arc welding. (8 marks)
- b) Highlight **four** factors that can contribute to the marketability of a fabricated product. (8 marks)
- c) Explain the difference between ferrous and non-ferrous metals stating an example for each. (4 marks)

13.

- a) Sketch a labelled diagram of an outside micrometer. (5 marks)
- b) With the aid of a sketch, describe each of the following drilling operations;
 - i. Countersinking (3 marks)
 - ii. Counterboring (3 marks)
- c) Sketch the following gas welding flames and state an application for each;
 - i. Neutral flame (3 marks)
 - ii. Oxidizing flame (3 marks)
 - iii. Carburizing flame (3 marks)

14.

- a) Define the following heat treatment processes;
 - i. Annealing (2 marks)
 - ii. Carburizing (2 marks)
 - iii. Hardening (2 marks)
- b) Outline **eight** steps followed when brazing. (8 marks)
- c) Explain the procedure of joining two plates by soft soldering method. (6 marks)