

071605T4MCT

MECHATRONICS TECHNICIAN LEVEL 5

ENG/OS/MC/CC/04/5/A

Perform Workshop Processes and Practices

July/August 2023



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

WRITTEN ASSESMENT

TI

INSTRUCTIONS TO CANDIDATES

1. This paper consists of THREE sections: **A**, **B** and **C**.
2. Answer ALL questions in sections A and B and TWO questions in section C.
3. Marks for each question are indicated in brackets.
4. Do not write on this question paper.

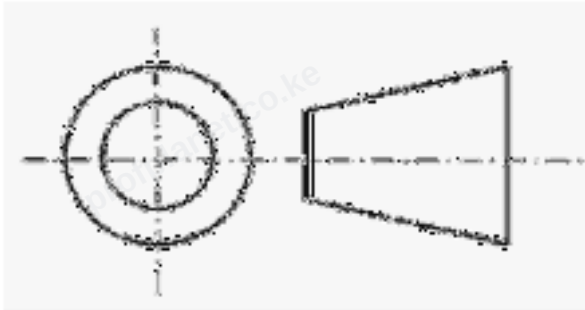
This paper consists of SEVEN printed pages.

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

SECTION A (20 MARKS)

Each question carries 1 Mark

1. Name the angle of projection represented by the symbol below in technical drawing.



- A. First angle
 - B. Third angle
 - C. Isometric
 - D. Perspective projection
2. _____ is classified as a marking tool.
- A. Tins snip
 - B. Tape measure
 - C. Centre punch
 - D. Vernier height gauge
3. What is the use of a try square?
- A. For Scribing lines
 - B. For Technical drawing
 - C. For sawing
 - D. For checking the trueness of a normal surface
4. Which of the following PPEs protects the user from hazardous gases?
- A. Safety boot
 - B. Ear muffs
 - C. Mask
 - D. Overalls

5. Define the term boring as a workshop operation.
 - A. Enlarging an existing hole
 - B. Drilling of a hole
 - C. Making internal threads
 - D. Smoothing an existing hole
6. _____ is a lathe machine operation?
 - A. Lapping
 - B. Knurling
 - C. Fullering
 - D. Bending
7. _____ Is a process of machining flat, curved or irregular surfaces by feeding the work-piece against a rotating multi-cutter?
 - A. Turning
 - B. Milling
 - C. Shaping
 - D. Drilling
8. Thread cutting is an operation aimed _____ eads on materials. In regards to this, what are die stock used?
 - A. Cutting external threads
 - B. Thread cutting
 - C. Holding the die
 - D. Cutting internal threads
9. Which one of the following tools is used for cutting threads on a work-piece?
 - A. Pliers
 - B. Stripping knife
 - C. Tap
 - D. Hacksaw
10. _____ is the device used in holding work-piece in a Lathe machine?
 - A. Chuck
 - B. Vice
 - C. Spindle
 - D. Table

11. _____ is a lathe operation which involves gradual reduction of diameter from one end of cylindrical work piece to the other?
- A. Knurling
 - B. Taper turning
 - C. Facing
 - D. Tapping
12. A device improvised for holding tool during drilling is known as?
- A. Chuck
 - B. Tap screw
 - C. Step block
 - D. Fixture
13. What is the use of a gimlet in mechanical workshop?
- A. Drilling
 - B. Marking
 - C. Reaming
 - D. Boring
14. Why is it important to check the _____ of work before operation on a lathe machine?
- A. To avoid wobbling of the work piece
 - B. To hold the work piece tightly
 - C. To improve vision of the work piece
 - D. To avoid falling off of the work piece
15. Which of the following is a benefit of good housekeeping practices in a workshop?
- A. Ease of flow of materials
 - B. Frequent accidents
 - C. Frequent machine breakdown
 - D. Low work morale
16. Flux during soldering is used for?
- A. Preventing oxidation
 - B. Cleaning the surfaces
 - C. Shearing
 - D. Reaming
17. Which one among the following is a surface finishing process?

- A. Honing
- B. Chamfering
- C. Taper turning
- D. Facing

18. Which of the following is a hand tool used in a mechanical workshop?

- A. Hacksaw
- B. Planer
- C. Jigsaw
- D. Lathe machine

19. What is the use of files in a mechanical workshop?

- A. Removing sharp and rough edges from the cut metal
- B. Cutting
- C. Joining
- D. To shape or size the work-piece

20. _____ is the difference between acceptable maximum and minimum dimensions given for a hole, shaft or

- A. Allowance
- B. Precision
- C. Tolerance
- D. Projection

SECTION B (40 MARKS)

Answer ALL the questions from this section.

21. State THREE types of files in a mechanical workshop. (3 Marks)
22. Highlight FOUR precautions to be observed in the workshop. (4 Marks)
23. Differentiate between Up Milling and Down Milling Operations. (4 Marks)
24. Identify FOUR factors that may affect the cutting speed of a lathe machine. (4 Marks)
25. Distinguish between drilling and tapping. (4 Marks)
26. List THREE reasons for using a cutting fluid in a lathe or drilling operations. (3 marks)
27. Highlight FOUR advantages of workshop tools and equipment maintenance. (4 Marks)
28. Using a well labelled sketch, explain countersinking operation as performed using a drilling machine. (4 Marks)
29. With the aid of a simple labeled diagram, explain plain milling operation. (5 Marks)
30. Name FIVE marking tools commonly used in a mechanical workshop. (5 marks)

SECTION C (40 MARKS)

Attempt TWO questions in this section

31.

- a) Explain FOUR joining and assembly methods used in workshop. (8 Marks)
- b) Discuss FOUR types of maintenance in a machine workshop. (12 Marks)

32. Drilling and lathe machines play a big role in work-piece machining in every mechanical workshop.

- a) Describe FIVE operations that can be carried out on a drilling machine. (10 marks)
- b) Explain FIVE operations that can be carried out on a lathe machine. (10 marks)

33.

- a) With the aid of a sketch, illustrate the following as applied in limits and fits. (6 marks)

- i. Tolerance
- ii. Lower limit
- iii. Upper limit
- iv. Allowance

- b) The size of shaft is given as; $10^{+0.05}_{-0.03}$. (6 marks)

- i. Upper limit size
- ii. Lower limit size
- iii. Tolerance

- c) Differentiate between Soldering and brazing. (2 marks)
- d) Discuss THREE common defects encountered during welding. (6 marks)