07150554B

MECHANICAL PRODUCTION TECHNOLOGY LEVEL 5

ENG/OS/ME/CC/04/05 Produce Components on a Milling Machine November/December 2025

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

WRITTEN ASSESSMENT

Time: 3 HOURS

INSTRUCTIONS TO CANDIDATE

1. This paper consists of **TWO** sections: **A** and **B**.
2. Answer **ALL** questions in section A and **ANY THREE** (
3. Marks for each question are indicated in the brackets.
4. Candidates are provided with a separate answer booklet
5. Do not write on the question paper.

This paper consists of FOUR (4) printed pages

Candidate 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 the questions in this section.

1. A technician needs to cut a slot in a mild steel workpiece with a suitable cutter. List THREE types of milling cutters that could be used. (3 Marks)
2. During an inspection of a milled workpiece, you find that the machined surface has poor finish. Identify THREE factors that could have caused this. (3 Marks)

3. Outline TWO work holding devices commonly used in milling operations. (2 Marks)

4. A customer requires a component with high dimensional accuracy. List FOUR inspection tools you would recommend to achieve this. (4 Marks)
5. The operator must choose between up-milling and down-milling for a milling operation. Highlight TWO differences between the two. (4 Marks)
6. Face milling operation on a wide surface can be performed using specific cutters. List THREE suitable cutters for this operation. (3 Marks)
7. A machined slot shows burrs along the edges, outline;

   i. TWO causes for this effect; (2 Marks)
   ii. ONE remedy for each of the cause in (i) above (2 Marks)
8. State THREE factors to consider when interpreting. (3 Marks)

9. A component requires accurate slot depth. List THREE tools for measuring its depth after milling. (3 Marks)
10. Outline problems caused by backlash in milling. (3 Marks)

11. The machine vibrates excessively during climb milling. Highlight THREE causes of this phenomenon. (3 Marks)

12. Before beginning a slotting operation on a mild steel plate, the instructor asks the trainee to confirm machine. List THREE checks they need to confirm. (3 Marks)

13. During a break, a technician leaves the milling machine running while he steps out of the workshop. Outline TWO dangers of this action. (3 Marks)

SECTION B (60 MARKS)

Answer Any THREE Questions in This Section

14.

a. You are tasked to produce a component using a horizontal milling machine. Describe the step-by-step procedure for setting up and performing the milling operation from machine preparation to completion. (10 Marks)

b. During preventive maintenance, it is observed that the milling machine has worn out parts. Discuss FIVE roles of this type of maintenance in ensuring machine optimum production. (10 Marks)

15.

a. The following are milling operations set ups. With an aid of a diagram, describe the set ups. (8 Marks)

   i. Down cut

   ii. Up cut

b. With an aid of a sketch, explain how the following milling operations are done.

   i. Straddle

   ii. Gang milling

   iii. Form milling. (12 Marks)

16.

a. A group of operators completed a production shift and left the workplace ready for the next team. Describe FIVE good practices they carry out before leaving. (5 Marks)

b. After finishing a slot milling operation, a technician is required to write a job report.

   i) Describe FIVE details that must be included when writing it. (5 Marks)

   ii) Discuss FIVE importance of job report in machining operations. (10 Marks)

17. A small manufacturing company has received an order to produce 20 precision slots ($10\,m \times 50\,mm\,long \times 5\,mm\,deep$) on mild steel plates using a horizontal milling machine.

a. Outline FIVE safety precautions you would observe before and during the operation. (5 Marks)

b. Describe FIVE setup procedure for holding both the workpiece and the cutting tool securely. (5 Marks)

c. Outline FIVE steps you would follow to carry out the slot milling operation accurately. (5 Marks)

d. State FIVE quality documentation you would complete after machining to meet workplace procedures. (5 Marks)