higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

# MARKING GUIDELINE

## NATIONAL CERTIFICATE (VOCATIONAL)

## FITTING AND TURNING
## NQF LEVEL 2

## 28 November 2023

**This marking guideline consists of 5 pages.**

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## QUESTION 1

1.1 1.1.1 True
1.1.2 True
1.1.3 False
1.1.4 False
1.1.5 False

(5 × 1) (5)

A – Motor
B – Eye shield/Safety shield
C – Cover/Guard
D – Wheel/Grinding wheel/Stone/Grinding stone
E – Tool rest/rest
F – ON/OFF Switch

(6 × 1) (6)

1.3 D = 200 mm = 0,20 m✓
S = 1 670 m/min
N = ?

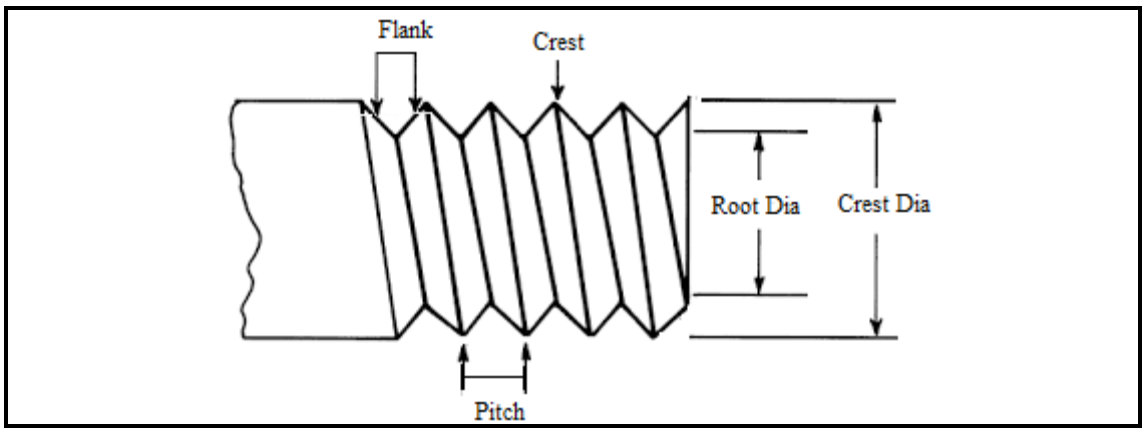
S = πXDXN✓

$$N = \frac{S}{\Pi \times D} \checkmark$$

$$= \frac{1\ 670}{(\pi \times 0{,}20)} \checkmark$$

= 2 658 r/min✓ (5)

1.4




(ONE mark for accuracy) (5 + 1) (6)

1.5
- Straight-flute (parallel) reamer)
- Helical flute reamer
- Taper reamer
- Expanding reamer
- Adjustable reamer
- Machine reamer (Any 3 × 1) (3)

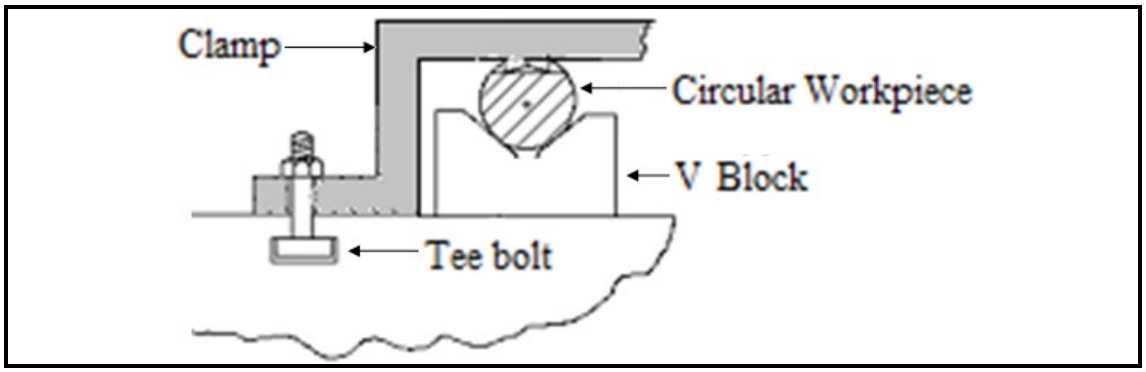
**[25]**

## QUESTION 2

2.1
A – Motor for elevating the arm
B – Motor for driving the drill spindle
C – Table
D – Base
E – Column
F – Radial arm

(6 × 1) (6)

2.2




(TWO marks for accuracy and neatness) (4 + 2) (6)

2.3
2.3.1 Dry
2.3.2 Soluble oil
2.3.3 Soluble oil EP (extreme pressure)

(3 × 1) (3)

2.4
- Select the correct size by its number.
- Remove any burrs and rough edges from the shaft and hub.
- Thoroughly clean the shaft and hub.
- Fit the key by gently tapping it with a soft mallet. (4)

2.5
- External circlip
- Internal circlip (2 + 2) (4)

2.6 A Helicoil is a spring which has an external and internal thread shape. (2)

**[25]**

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## QUESTION 3

3.1
- Parallel turning
- Taper turning
- Screw threads cutting
- Boring
- Drilling
- Parting
- Knurling
- Facing
- Chamfering

(Any other relevant answers) (Any 5 × 1) (5)

3.2
- Insert the cutting tool in the tool post holder and tighten it.
- Insert a solid centre or revolving centre into the tailstock spindle.
- Position the cutting tool tip and tailstock centre together, by rotating the tool post and driving out the tailstock centre.
- If the cutting tool is below/above the point of the tailstock centre, then you need to raise/lower it until it is in line with the point of the centre.
- Adjust the screw until the edge of the cutting tool lines up with the point of the centre in the tailstock.

(Any other relevant answers) (5)

3.3
A – Centre
B – Spindle
C – Spindle locking lever
D – Nut
E – Handle Wheel
F – Frame

(6 × 1) (6)

3.4
- Speed too high
- Fate rate too high
- Parting tool above centre height, which causes excessive rubbing
- Parting tool set too low
- Lack of coolant
- Parting tool not sharpened properly
- Cutting operation is too far from the chuck
- Parting tool not clamped properly
- Work not tightly gripped in a chuck

(Any other relevant answers) (Any 5 × 1) (5)

3.5
- A wide range of regular and irregular shapes can be held.
- Work can be set to run concentrically or eccentrically.
- Considerable gripping power, so that heavy cuts can be taken.
- There is no loss of accuracy if the chuck becomes worn.
- The chuck stays accurate, even if it is worn.
- One can readily do facing and boring.

(Any other relevant answers) (Any 4 × 1) (4)

**[25]**

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## QUESTION 4

4.1
- Clean the table of the machine thoroughly (do not use compressed air).
- Clean the vice thoroughly.
- Spread a thin layer of oil on the table surface.
- Gently place the vice on top of the table.
- Obtain machine bolts and place the bolts in the slots of the table and of the vice. A washer should be used between the nut and the vice. Tighten the bolts. (Any other relevant answers) (5)

4.2
4.2.1 Overarm
4.2.2 Knee
4.2.3 Table trips
4.2.4 Saddle
4.2.5 Column

(5 × 1) (5)

4.3
A – Slot cutter
B – T-slot cutter
C – End-Mill cutter
D – Dove-tail cutter
E – Helical cutter

(5 × 1) (5)

4.4 When manufacturing a work piece, the allowable deviation✓ from the required size (12 mm) may be bigger (12,00 + 0,02 = 12,02 mm)✓✓ or smaller (12,00 - 0,02 = 11,98 mm).✓✓ (5)

4.5 Loosen the machine vice and place it in line with movement of the table.✓ Obtain a parallel bar/parallel strip that is about the length as that of the vice jaws (the parallel bar should protrude above the vice jaws).✓
Insert a dial test indicator (DTI) in the magnetic stand onto the machine✓ with the needle touching the fixed jaw of the vice. Zero the DTI.✓ Move the table by the handle along the length of the parallel bar. Take note of the reading on the DTI.✓ Loosen the bolts of the vice and adjust the vice until the vice is parallel to the machine and tighten the machine vice bolts when everything is satisfactory.

(Any 5 × 1) (5)
**[25]**

**TOTAL: 100**

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