



**higher education
& training**

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

MARKING GUIDELINE

NATIONAL CERTIFICATE (VOCATIONAL)

**FITTING AND TURNING
NQF LEVEL 2**

10 March 2022

This marking guideline consists of 5 pages.

QUESTION 1

- 1.1 1.1.1 D
 1.1.2 D
 1.1.3 C
 1.1.4 D
 1.1.5 B
 1.1.6 D
 1.1.7 A
 1.1.8 A
 1.1.9 C
 1.1.10 B

(10 × 1) (10)

- 1.2 • Hardness of the workpiece
 • Amount of material to be removed/ground
 • Finish
 • Speed of the wheel
 • Wet or dry grinding
 • Accuracy
 • Contact surface area
 • Type of a grinding machine
 • Amount of work

(Any relevant 5 × 1) (5)

- 1.3 D = ?
 S = 1 450 m/min
 N = 1 540 r/m

$$S = \pi \times D \times N \checkmark$$

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

$$= \frac{1\,450}{(\pi \times 1\,540)} \checkmark$$

$$= 0,3 \text{ m} \checkmark$$

$$= 300 \text{ mm} \checkmark$$

(5)

- 1.4 • Make sure that the correct size die nut is used.
 • Check for the correct diameter of the shaft.
 • Ensure that the die is correctly inserted into the stock and secured.
 • Place the die over the shaft, add cutting lubrication and turn the stock making one clockwise revolution.
 • Then half a turn anticlockwise to break off the thread.

(Any relevant 5 × 1) (5)

[25]

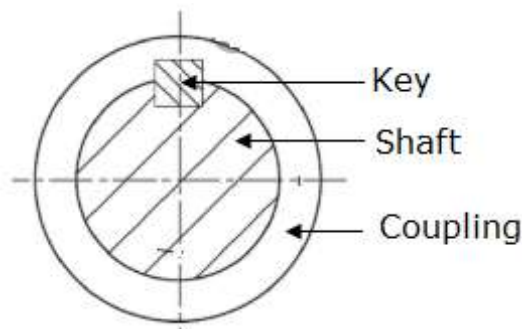
QUESTION 2

- 2.1 A – Motor
 B – Speed control lever
 C – Feed handle
 D – Table
 E – Base
 F – Chuck (6 × 1) (6)

- 2.2
- Machine vice
 - Angle plate
 - V-blocks
 - Finger clamps
 - U-clamps
 - Straight clamps (Any relevant 5 × 1) (5)

- 2.3
- Depth of the hole
 - Diameter of the hole
 - Position of the hole
 - Finishing of the hole
 - Angle of the hole
 - Finishing of the edges (burrs) (Any relevant 4 × 1) (4)

2.4



(2 for sketch + 3 for labelling) (5)

- 2.5
- Rectangular/Parallel key
 - Taper gib-head key
 - Feather key
 - Woodruff key
 - Taper key (5)

[25]

QUESTION 3

- 3.1
- Use the correct personal protective equipment (PPE).
 - Use the correct speeds.
 - Use the correct feeds.
 - Ensure that the workpiece is secure in the chuck.
 - Use a metal hook to remove shavings.
 - Do not clean the machine while it is running.
 - Remove the chuck key before starting the machine. (Any relevant 5 × 1) (5)
- 3.2
- A – Headstock
B – Toolpost
C – Tailstock
D – Lead screw
E – Base
F – Apron (6 × 1) (6)
- 3.3
- Thread cutting
 - Facing
 - Drilling and boring
 - Reaming
 - Turning cylindrical surfaces
 - Taper turning
 - Knurling
 - Grooving
 - Parting off
 - Cutting internal keyway (Any relevant 5 × 1) (5)
- 3.4
- Clamp the cutting tool in the tool post.✓
 - Insert a centre into the tailstock spindle.✓
 - Slide the tailstock centre towards the cutting face of the tool.✓
 - Adjust the cutting tool height until it is in line with the centre✓ by lifting or lowering the tool.✓
 - Tighten the toolpost and recheck if the tool and centre are aligned.✓ (Any relevant 6 × 1) (6)
- 3.5
- It is easy to set the workpiece.
 - Work can be easily performed on the end face of the workpiece.
 - Internal and external jaws are available. (Any relevant 3 × 1) (3)

[25]

QUESTION 4

4.1	<ul style="list-style-type: none"> • Table • Arbor support • Knee • Base • Column • Arbor • Overarm • Spindle • Bracing arms 	(Any relevant 5 × 1)	(5)
4.2	A – Dovetail cutter B – End mill C – T-slot cutter D – Helical cutter E – Slot cutter	(5 × 1)	(5)
4.3	The required diameter of the shaft is 25 mm. ✓ A tolerance $25 \pm 0,05$ mm means that the outside diameter can be 0,05 mm bigger ✓ that is 25,05 mm ✓ or 0,05 mm smaller ✓ (24,95 mm). ✓	(Any relevant answer)	(5)
4.4	<ul style="list-style-type: none"> • Type of material being cut • Speed • Finish texture • Design (capability) of the machine • Type of tool used 	(Any relevant 5 × 1)	(5)
4.5	<ul style="list-style-type: none"> • Lack of coolant • Insufficient lubrication • Electrical faults • Workpiece coming loose • Cutting tools becoming blunt • Play on the slides 	(Any relevant 5 × 1)	(5)
TOTAL:			100

[25]