



higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

MARKING GUIDELINE

NATIONAL CERTIFICATE (VOCATIONAL)

**MACHINE MANUFACTURING
NQF LEVEL 3**

7 March 2022

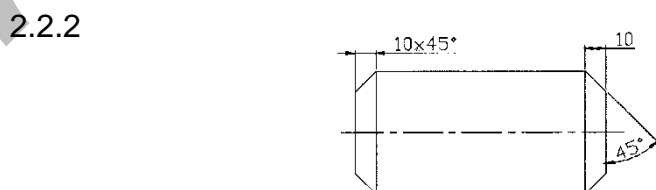
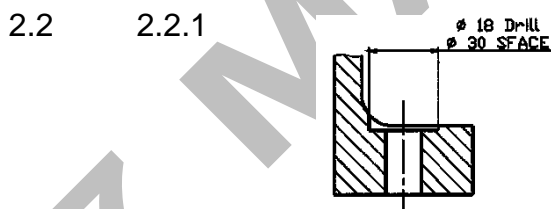
This marking guideline consists of 6 pages.

QUESTION 1

- | | | | | |
|-----|--|-------|---------|-------------|
| 1.1 | 1.1.1 | C | | |
| | 1.1.2 | E | | |
| | 1.1.3 | B | | |
| | 1.1.4 | A | | |
| | | | (4 × 1) | (4) |
| 1.2 | 1.2.1 | False | | |
| | 1.2.2 | False | | |
| | 1.2.3 | True | | |
| | 1.2.4 | True | | |
| | 1.2.5 | True | | |
| | | | (5 × 1) | (5) |
| 1.3 | The vibration✓ of the headstock could cause the tools to move onto the spinning chuck,✓ which will catapult the tools in various directions including onto the operator with resultant injuries.✓ | | | (3) |
| 1.4 | Without proper lighting, it is difficult to read and operate machine controls✓ with possible resultant injuries✓ to the operator as well as damage to the work piece. Bad lighting can cause a person to lose focus and to make unnecessary mistakes.✓ | | | (3) |
| | | | | [15] |

QUESTION 2

- | | | | | |
|-----|-------|-------------------------------|---------|-----|
| 2.1 | 2.1.1 | $16 + 0,018 = 16,018$ | | |
| | 2.1.2 | $16 - 0,017 = 15,98$ | | |
| | 2.1.3 | 0,018 | | |
| | 2.1.4 | $- 0,006 - (- 0,017) = 0,011$ | | |
| | | | (4 × 2) | (8) |



(2 × 2) (4)

2.3 2.3.1



2.3.2



2.3.3



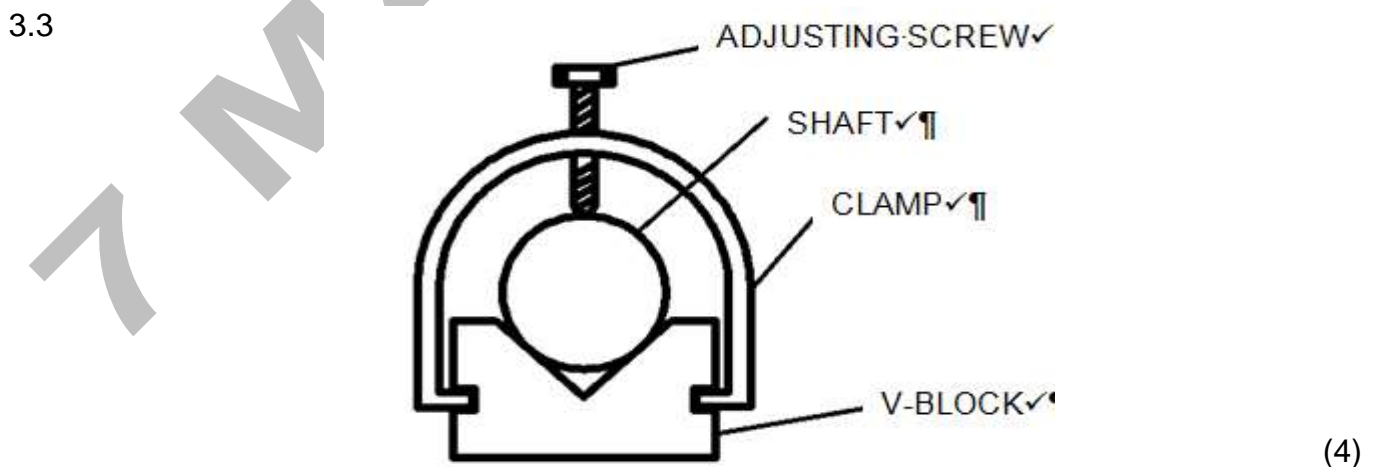
(3 × 1) (3)
[15]

QUESTION 3

3.1 3.1.1 B
3.1.2 A
3.1.3 C
3.1.4 C

(4 × 1) (4)

- 3.2
- When the jaws of the vice are higher than the work piece, parallels are used to raise the work piece.
 - When the work piece has to be placed in a vice so that it can clear the vice.
 - So that the work piece remains vertical and horizontal when being clamped for machining.
- (3)



3.4 $V = \pi \times D \times N \checkmark$ (π = 3,142)
 $V = 3,142 \times 20 \times 190/60 \checkmark$
 $V = \underline{199 \text{ mm/s}} \checkmark \checkmark$

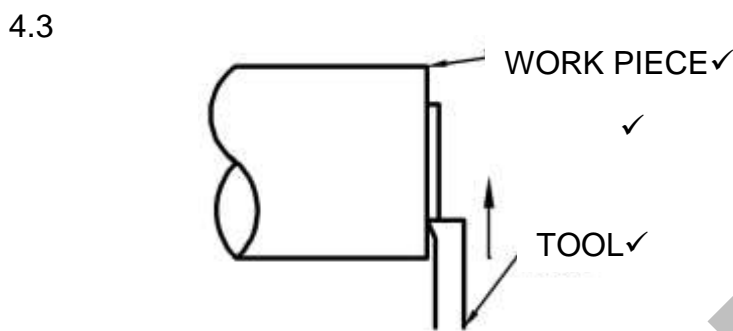
(4)
[15]

QUESTION 4

- 4.1 4.1.1 B
 4.1.2 A
 4.1.3 C
 4.1.4 D

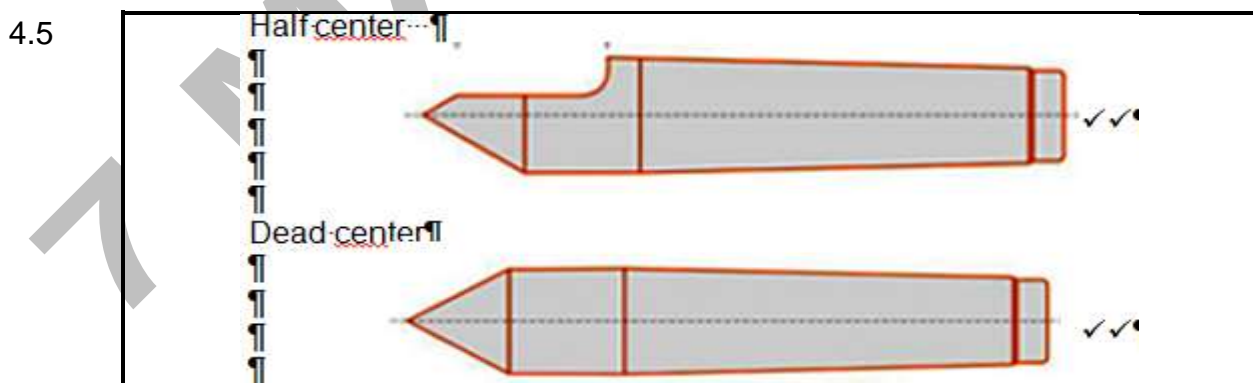
(4 × 1) (4)

- 4.2. • The lead screw moves the carriage forwards when screw cutting is being done.
 • The feed shaft controls automatic movement of the saddle for parallel turning or facing. (2 × 2) (4)



(3 × 1) (3)

- 4.4 • Facing
 • Boring
 • Screw cutting
 • Tapping
 • Parallel turning
 • Taper turning
 • Knurling
 • Reaming
 • Drilling (Any 4 × 1) (4)



(4 × 1) (4)

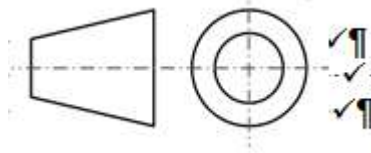
4.6	4.6.1	Column		
	4.6.2	Knee		
	4.6.3	Tilting head		
	4.6.4	Cutter		
	4.6.5	Saddle		
	4.6.6	Base	(6 × 1)	(6)
4.7	Indexing = $40/N$ ✓ = $40/21$ ✓ = 1 and $19/21$ ✓ = 1 full turn✓ + 19 holes on a 21-hole circle plate✓			(5)
4.8	4.8.1	Face mill✓ – Can remove large amount of material in a single cut✓		
	4.8.2	End mill✓ – Used to mill slots, facing and profiling✓		
	4.8.3	Gear cutter✓ – To cut gear profile✓	(3 × 2)	(6)
4.9	4.9.1	True		
	4.9.2	False		
	4.9.3	True		
	4.9.4	False	(4 × 1)	(4)
				[40]

QUESTION 5

5.1	<ul style="list-style-type: none"> • Drawing is fast and accurate. • Ideal for repetitive work. • Drawings can easily be upgraded or altered. • 2D and 3D drawings are easily made. • Digital storage taking up very little space. • Drawings can be emailed. • Colour easily included. • CAD designs can be manufactured by CAM. • Drawings can directly download to a CNC machine. • Drawings can be linked to a database so that materials can be ordered from the drawing. 		(Any 4 × 1)	(4)
5.2	5.2.1	polygon		
	5.2.2	trim		
	5.2.3	Undo	(3 × 1)	(3)

- 5.3
- Select size, scale and orientation of the drawing on a new document.
 - Plan your drawing to make use of the space.
 - Decide how many views are going to be used for the drawing.
 - Create different layers, if necessary, to make different line types.
 - If you add dimension to your drawing, remember to have enough space around the drawing to add them later.
- (5)

5.4.



(3)
[15]

TOTAL: 100