



higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

MARKING GUIDELINE

NATIONAL CERTIFICATE (VOCATIONAL)

**MACHINE MANUFACTURING
NQF LEVEL 3**

27 February 2023

This marking guideline consists of 6 pages.

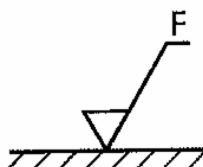
QUESTION 1

- | | | | | |
|-----|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------|---------|--------------------|
| 1.1 | 1.1.1
1.1.2
1.1.3
1.1.4 | D
E
A
C | (4 × 1) | (4) |
| 1.2 | 1.2.1
1.2.2
1.2.3
1.2.4
1.2.5 | True
True
False
True
True | (5 × 1) | (5) |
| 1.3 | <ol style="list-style-type: none"> 1. Identify the hazard. 2. Decide who might be harmed and how. 3. Evaluate the risks and decide on precautions. 4. Record your findings and implement them. 5. Review your assessment and update it if necessary. | | | (5) |
| 1.4 | Risk = Probability × Severity | | | (1)
[15] |

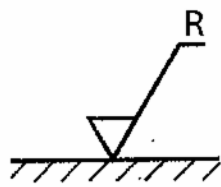
QUESTION 2

- | | | | | |
|-----|----------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|-----|
| 2.1 | 2.1.1
2.1.2
2.1.3
2.1.4 | <p>Push fit is obtained with some slight force by hand.</p> <p>Sliding fit is obtained where two mating components slide freely forward and backward over each other.</p> <p>Running fit is obtained where two mating components fit into each other smoothly but not loosely.</p> <p>Shrink fit is obtained when a smaller hole is expanded by heat and then placed in a position over the shaft and allowed to cool down.</p> | (4 × 2) | (8) |
|-----|----------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|-----|

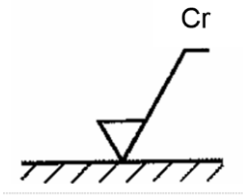
- 2.2 2.2.1



- 2.2.2

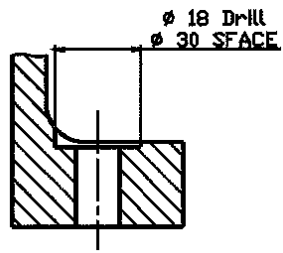


2.2.3

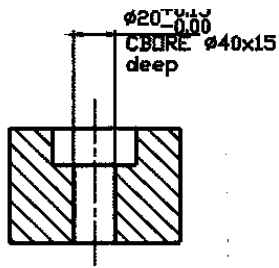


(3 × 1) (3)

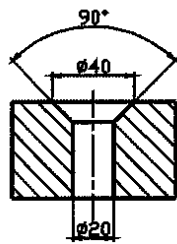
2.3 2.3.1



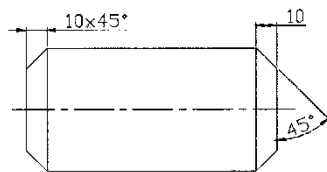
2.3.2



2.3.3



2.3.4

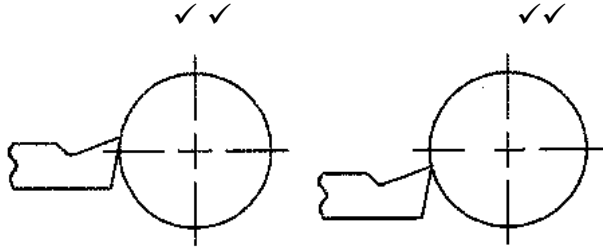


(4 × 1) (4)
[15]

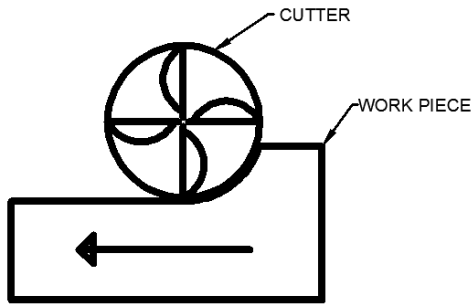
QUESTION 3

- 3.1 3.1.1 C
 3.1.2 A
 3.1.3 D
 3.1.4 B
(4 × 1) (4)
- 3.2 A – Angle plate
 B – Parallels
 C – Vice
 D – V-block
(4 × 1) (4)
- 3.3 A
(2)
- 3.4 $V = \pi \times D \times N$ ✓ ($\pi = 3,142$)
 $V = 3,142 \times 14 \times 220/60$ ✓✓
 $V = 161,27 \text{ mm/s}$ ✓✓
(5)
[15]

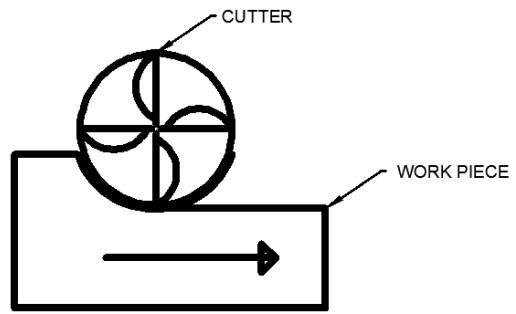
QUESTION 4

- 4.1 • Dead centre
 • Revolving centre
 • Pipe centre
 • Half centre
(4)
- 4.2 • Type of material that will be used
 • Sizes and shape of the workpiece
 • Type of machining to be carried out
(3)
- 4.3 ✓ ✓ ✓ ✓

(2 + 2) (4)
- 4.4 1. Headstock
 2. Tailstock
 3. Carriage or apron
 4. Chuck
 5. Tool post
(5 × 1) (5)
- 4.5 Indexing = $40/N$ ✓
 = $40/31$ ✓
 = 1 and $9/31$ ✓
 = 1 full turns ✓ + 9 holes on a 31 hole circle plate ✓
(5)

4.6



Y CLIMB MILLING



CONVENTIONAL MILLING

(3 + 3) (6)

4.7 T-slot cutter

(2)

- 4.8
- A – Foot stock
 - B – Centre
 - C – Chuck
 - D – Direct index
 - E – Sector arms
 - F – Vernier scale
 - G – Lock
 - H – Dividing head
 - I – Handle

(9 × 1) (9)

4.9 Edge finder

(2)

[40]

QUESTION 5

5.1

INPUT	OUTPUT
<ul style="list-style-type: none"> • Keyboard • Mouse • Scanner • Microphone <p style="text-align: right;">(Any THREE)✓✓✓</p>	<ul style="list-style-type: none"> • Printer • Screen • Speakers • Projector <p style="text-align: right;">(Any THREE)</p>

(3 + 3)

(6)

5.2

Advantages

- Fast and accurate drawing
 - Ideal for repetitive work
 - Drawings easily upgraded or altered
 - 2D and 3D drawings easily made
 - Digital storage taking up very little space
 - Drawings emailed
 - Colour easily included
 - CAD designs manufactured by CAM
 - Drawings directly downloaded to a CNC machine
 - Drawings linked to a database so that materials can be ordered from the drawing
- (Any TWO)

Disadvantages

- Some programs expensive
 - Heavy computing power required
 - High initial expense of hardware
 - CAD packages complicated and take some time to learn
- (Any TWO)
(2 + 2)

(4)

5.3

- 5.3.1 True
- 5.3.2 False
- 5.3.3 False

(3 × 1)

(3)

5.4

Trim allows one to trim or cut an object exactly at the edge defined by another object or line.

(2)

[15]

TOTAL: 100