higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

MARKING GUIDELINE

NATIONAL CERTIFICATE (VOCATIONAL)

MACHINE MANUFACTURING
NQF LEVEL 3

19 November 2024

This marking guideline consists of 6 pages.

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QUESTION 1

1.1 1.1.1 C
1.1.2 B
1.1.3 B
1.1.4 A

(4 × 1) (4)

1.2 1.2.1 Foot brake
1.2.2 Light
1.2.3 Chuck guard
1.2.4 Splash tray

(4 × 1) (4)

1.3
- No person should work alone.
- Never lean against or sit on machine.
- Use all safety guards and safety equipment provided.
- Do not engage in horseplay when operating a machine.
- Never attempt to operate a machine unless you are appropriately trained.
- Never leave a machine in motion unattended.
- Never reach across or into a machine.
- There must be only one operator on a machine at a time

(Any relevant answer 5 × 1) (5)

1.4
- Replace the covers on the lathe to decrease the coolant spray onto the floor.
- Put an extra screening protector by the lathe.
- Clean up the coolant in regular interfaces.
- Put wet floor warning sign up.

(Any relevant answer 2 × 1) (2)

[15]

QUESTION 2

2.1
- ISO – International Organization for Standardization✓
- It is a system used internationally✓ so that everyone knows the accepted sizes to be manufactured.✓ It uses dedicated letters and numbers that everyone can understand.✓ (4)

2.2 2.2.1 False
2.2.2 False
2.2.3 False
2.2.4 True
2.2.5 False
2.2.6 False

(6 × 1) (6)

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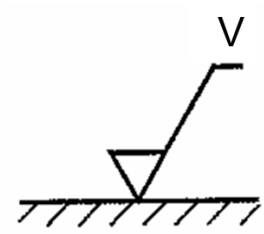
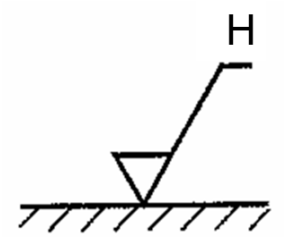
2.3 2.3.1

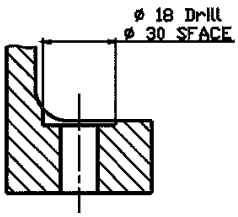


2.3.2

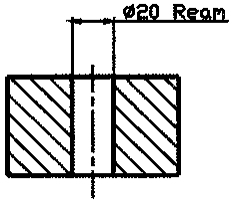


(2 × 1) (2)

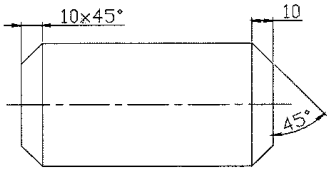
2.4 2.4.1



2.4.2



2.4.3



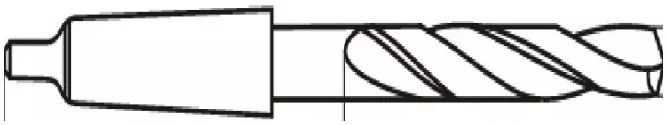
(3 × 1) (3)
[15]

QUESTION 3

3.1 3.1.1 Centre drilling
3.1.2 Drilling
3.1.3 Countersinking
3.1.4 Reaming

(4 × 1) (4)

3.2



Taper shank



Parallel shank (2 × 2) (4)

3.3 V = 3,142 × D × N✓ (π = 3,142)
N = V/(3,142 × D)✓
N = 70/(3,142 × 0,01)✓
N = <u>2 229,3 rpm</u>✓✓ (5)

3.4 3.4.1 False
3.4.2 False
(2 × 1) (2)
[15]

QUESTION 4

4.1 4.1.1 Thread cutting tool
4.1.2 Parting cutting tool
4.1.3 Right-hand knife tool
4.1.4 Grooving tool
4.1.5 Boring bar tool
(5 × 1) (5)

4.2 4.2.1
- The workpiece in a lathe rotates at a high rpm and has to be clamped very well.
- The workpiece in a milling machine is stationary and is clamped down onto the table.

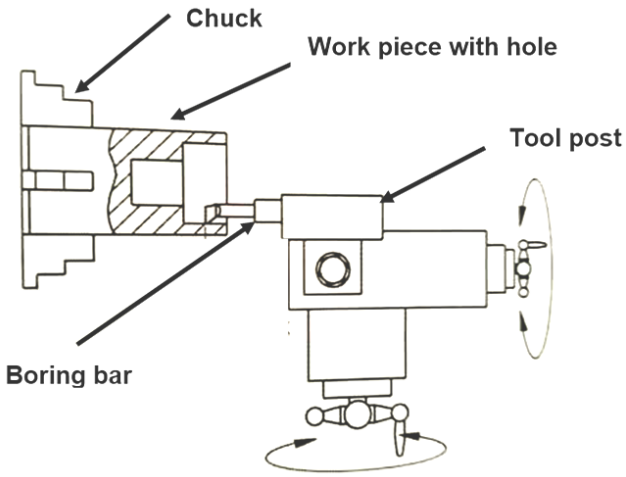
4.2.2
- On a lathe, the tools are clamped in the tool post.
- On a milling machine, the tools are clamped in the spindle.

4.2.3
- The lathe machine has two axes: X and Z.
- The milling machine has three axes: X, Y and Z.

(3 × 2) (6)

4.3
- Drill the workpiece with a drill about 27 mm in diameter.
- Select the boring bar that would fit in the 27-mm hole. Make sure it has enough clearance.
- Make sure the boring bar has the required length for the depth of the hole to be machined.
- Start cutting the diameter of the hole and check the sizes with a measuring tool regularly.
- On the last cut, make sure the hole is cleaned of any swarf before taking the cut to 30,25 mm in diameter. (5)

4.4



(FOUR marks for the labels and ONE mark for the drawing) (5)

4.5
4.5.1 True
4.5.2 False
4.5.3 False

(3 × 1) (3)

4.6 Indexing = N/9°✓
= 117/9✓
= 13✓
= 13 full turns and 0 holes on any circle plate✓✓ (5)

4.7
4.7.1 A
4.7.2 B
4.7.3 B
4.7.4 A

(4 × 1) (4)

4.8
4.8.1 Workpiece
4.8.2 Chuck
4.8.3 Direct index
4.8.4 Vernier scale
4.8.5 Index plate
4.8.6 Crank handle
4.8.7 Sector arms

(7 × 1) (7)

[40]

QUESTION 5

5.1
- Suitable for repetitive work
- Drawing is fast and accurate
- Drawings can be upgraded and altered easily
- 2D and 3D drawings are made easily
- Storage is done digitally, taking up very little space
- Drawings can easily be e-mailed to others
- Colour is included easily
- Drawings can be downloaded directly to a CNC machine (Any 5 × 1) (5)

5.2 Layers are required so that the object's visibility (i.e. ON and OFF) and accessibility can be controlled. (2)

5.3
5.3.1 To draw a line
5.3.2 To draw a polyline
5.3.3 To draw a circle by entering the radius
5.3.4 To trim a part

(4 × 2) (8)
[15]

TOTAL: 100

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