higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

MARKING GUIDELINE

NATIONAL CERTIFICATE (VOCATIONAL)

FITTING AND TURNING
NQF LEVEL 2

11 March 2020

This marking guideline consists of 5 pages.

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QUESTION 1

1.1
1.1.1 True
1.1.2 False
1.1.3 True
1.1.4 True
1.1.5 True

(5 × 1) (5)

1.2
A – Washer
B – Flange
C – Blotting paper
D – Plastic washer/Plastic spacer
E – Grinding wheel

(5 × 1) (5)

1.3
D = 200 mm = 0,2 m✓
S = 1 750 m/min
N = ??

$S = \pi \times D \times N$✓

$$N = \frac{S}{\pi \times D}$$✓

$$= \frac{1750}{(\pi \times 0{,}2)}$$✓

= 2785 r/m✓ (5)

1.4
A – Flank
B – Crest
C – Root diameter
D – Crest diameter
E – Pitch

(5 × 1) (5)

1.5
- First cut or taper tap
- Second cut or intermediate tap
- Plug tap (3)

1.6
- Drilled holes too shallow
- Drilled holes too small
- Wrong type of tap
- Wrong tapping device
- Flutes clogged with chips
- Tap feed too fast
- Taping paste not used (Any 2 × 1) (2)

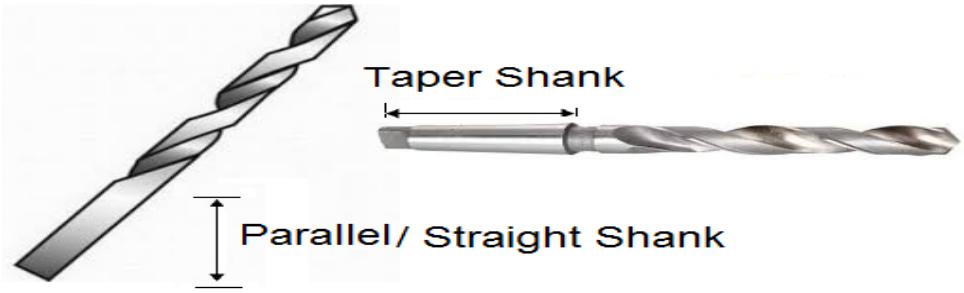
[25]

QUESTION 2

2.1
2.1.1 C
2.1.2 A
2.1.3 D
2.1.4 F
2.1.5 B
2.1.6 E

(6 × 1) (6)

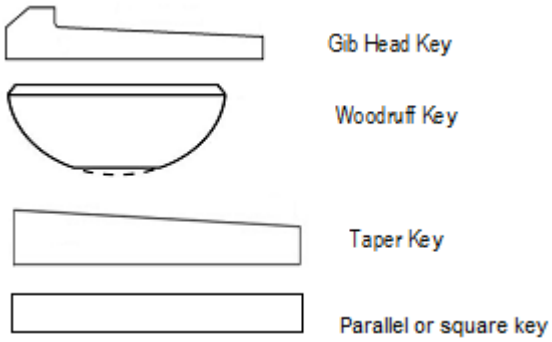
2.2



(Sketches 2 × 2 + labelling 2 × 1) (6)

2.3
- Ensure drilling machine is secure and stable
- All machine guards in place
- Chuck key removed
- Correct drill speeds and feeds selected (Any 2 × 1) (2)

2.4



(Sketches 4 × 1 + labelling 4 × 1) (8)

2.5
- Thread-cutting screws
- Self-tapping screws
- Drive screws (3)

[25]

QUESTION 3

3.1
- Parallel turning
- Taper turning
- Cutting of external and internal screw threads
- Boring
- Drilling
- Parting off
- Knurling (Any 5 × 1) (5)

3.2 A – Fixed steady
B – Chuck/Three-jaw chuck
C – Key/Chuck key
D – Knurling tool
E – Centre/Revolving centre (5)

3.3
- Setting up workpiece time consuming
- Chuck heavy to mount and unmount
- Chuck bulky to handle.
- Strong gripping force of jaws can damage workpiece
- Chuck difficult to set up, dial-test indicator to be used for accurate

(Any 4 × 1) (4)

3.4 In manual feed the operator adjusts the feed dial by hand,✓ which means it is not accurately controlled and the finish of the cutting is not smooth.✓

In automatic feed the machine mechanisms are used✓ to feed the cutting tool automatically into the workpiece✓ which makes it more accurate and the finish of the cutting smooth.✓✓ (5)

3.5
- Mark off the beginning and the end of the knurling by means of a sharp–pointed cutting tool.
- Adjust the centre lathe speed to slow and use a rapid feed.
- Place the tool in the tool holder and set it to centre height.
- Start the centre lathe and slowly force the knurling tool into the workpiece until a distinct pattern is formed.
- Flood the tool with coolant and engage the automatic feed.
- When the tool reaches the correct position on the opposite end of the workpiece, stop the lathe but do not disengage the feed.
- Reserve the spindle rotation and at the same time apply extra pressure and allow the tool to move back to the starting position. (Any 6 × 1) (6)

[25]

QUESTION 4

4.1
- Use the correct personal protective equipment.
- Ensure that the machine power supply is connected properly.
- Use the correct speed.
- Use the correct feed rates.
- Use guards or shields to deflect chips.
- Use gloves to mount milling cutters.
- Do not measure the workpiece while the machine is operating.
- Choose the correct tool for the job.
- Never start a machine or engage a feed until you are certain that the workpiece is properly secured.
- Keep the area around the machine free from dirt and spilled liquid.

(Any 5 × 1) (5)

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4.2 4.2.1 Shaft supporting cutters for horizontal milling

4.2.2 Preventing severe vibration and chattering due to overloading on the arbor and overarm

4.2.3 Automatically brought to rest at end of cut by trips activating switch

4.2.4 Saddle mounted on top of knee to support table

4.2.5 Drives arbor carrying the cutter

(5 × 1) (5)

4.3 T-slot cutter✓
First cut the groove✓ using either a side and face cutter, end mill or slot drill,✓ then cut the width of the bottom using a T–slot cutter✓ (4)

4.4
- Start the milling machine and get the cutter to rotate.
- Carefully raise the knee and table towards the rotating cutter.
- When the cutter just touches the workpiece, move the workpiece clear of the cutter and stop the cutter.
- Set the feed dial to zero.
- Using the handle, raise the knee until the correct 12 mm depth of cut registers on the dial.
- Lock the knee in position to prevent movement during the cutting operation.
- Set the cutter into motion and start cutting the depth set. (7)

4.5
- Ensure that the coolant flow is sufficient enough to cool the cutter and the workpiece.
- Make sure that the speed, feed rate and depth of cut is correct.
- Check that the workpiece is well secured in the vice.
- Ensure that the cutting tool is not blunt.
- Ensure that the table trips are positioned correctly and are secure when using the automatic feed. (Any 4 × 1) (4)

[25]

TOTAL: 100

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