higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

MARKING GUIDELINE

NATIONAL CERTIFICATE (VOCATIONAL)

FITTING AND TURNING
NQF LEVEL 2

04 March 2024

This marking guideline consists of 5 pages.

QUESTION 1

1.1
1.1.1 A
1.1.2 B
1.1.3 C
1.1.4 D
1.1.5 A

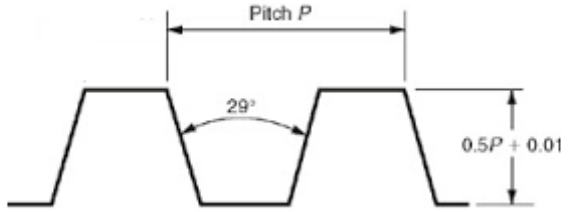
(5 × 1) (5)

1.2
- It is difficult to control the amount of material being removed.
- The cutters wear away and have to be replaced.
- It is difficult to keep the face of the wheel parallel to the edge of the wheel.
- The tool rest has to be adjusted away from the wheel before dressing the wheel, and then has to be reset in position. (Any 3 × 1) (3)

1.3
- Straight
- Cylindrical
- Flaring cup
- Dish
- Saucer (5 × 1) (5)

1.4
- Loading of the wheel
- Glazing of the wheel
- Wheel not running concentrically to the spindle (Any 2 × 1) (2)

1.5



(2 marks for accuracy) (5)

1.6 M = metric
10 = diameter of the thread
1.25 = pitch of the thread (3)

1.7 Spiral-fluted hand taper reamer
Straight-fluted hand taper reamer (2)

[25]

QUESTION 2

2.1 A – Motor
B – Spindle speed selector
C – Hand feed lever
D – Pillar
E – Base
F – Table (6)

2.2 D = ?
S = 25 × 1 000 = 25 000 mm/min✓
N = 300

S = π × d × N✓

$$D = \frac{S}{\pi \times N}$$ ✓

$$= \frac{25\,000}{(\pi \times 300)}$$ ✓

= 26,522 mm✓
Use = 27 mm (6)

2.3
- The shape of the workpiece
- The rigidity of the workpiece
- The pressure exerted by the drill
- The ease of locating and removing the clamps
- The greatest pressure by the clamp without damaging the workpiece (5)

2.4
- Width of the key
- Thickness of the key
- Diameter of the shaft
- Length of the key
- Keyway
- Hub (Any 4 × 2) (8)

[25]

QUESTION 3

3.1
- Dead centre
- Pipe centre
- Half centre
- Ball centre
- Revolving centre
- Driving centre (Any 5 × 1) (5)

3.2
- Adhere to all precautionary measures before switching on the machine.
- Make sure that the spindle rotates at the correct speed.
- Using the handles, advance the tool until it just touches the circular face and makes a very fine cut on the workpiece.
- Withdraw the tool by using the compound slide handle.
- Set the cross slide to zero. Make sure that no backlash is present. (5)

3.3
3.3.1 A
3.3.2 D
3.3.3 H
3.3.4 E
3.3.5 I
3.3.6 F

(6 × 1) (6)

3.4
- Workpieces can be bored.
- Workpieces can be rigidly clamped to resist heavy cuts.
- There are no moving parts that can lose their accuracy with wear.
- A wide range of regular and irregular components can be held.
- Work on the end face of the job is possible.
- Workpieces can be set to run concentrically or eccentrically.
- Workpieces can be set to a datum surface. (Any 4 × 1) (4)

3.5
- When loading or unloading a workpiece from the chuck or other holding device, the centre lathe should stand completely still.
- Observe all precautionary measures and do not wear loose clothing.
- Brushes or rags should be kept away from moving parts.
- Chuck keys should not be left in the chuck.
- Always disconnect, remove or stand clear from handwheels and levers before setting the machine or feed in motion.
- Never apply a wrench to revolving workpieces or parts.
- Never adjust the cutting tool while the centre lathe is in motion.
- Do not attempt to stop the machine by placing your hand on the chuck while the centre lathe is slowing down.
- Give attention to cutting fluid control before switching the machine on.

(Any 5 × 1) (5)
[25]

QUESTION 4

4.1 4.1.1
A – Column
B – Arbor
C – Milling cutter
D – Overarm
E – Table
F – Knee
G – Base (7)

4.1.2
- Plain, horizontal milling machine
- Universal milling machine
- Vertical milling machine
- Turret milling machine (Any 3 × 1) (3)

4.2
- To curb heavy chattering on the cutter
- To support the overarm
- To support the arbor against bending (3 × 2) (6)

4.3
- Conventional (up-cut) milling
- Climb milling (2 × 2) (4)

4.4
- Engineer square
- Vernier calliper
- Machine vice
- Plastic hammer
- Parallel strips/bars
- Clock gauge and stand
- Machine clamps
- Bolts, nuts and washers to fix the vice and clamps to the table
- Spanners for bolts and nuts
- Milling cutters (Any 5 × 1) (5)

[25]

TOTAL: 100