higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

# MARKING GUIDELINE

## NATIONAL CERTIFICATE (VOCATIONAL)

## ENGINEERING PROCESSES
## NQF LEVEL 4

## 14 November 2022

**This marking guideline consists of 4 pages.**

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## QUESTION 1

- Date the service was done
- Parts that were replaced
- Replacement part information
- Reason why the component broke down or needed to be service
- When the next service should be done
- Name and signature of the artisan who did the service **[6]**

## QUESTION 2

2.1
2.1.1 True
2.1.2 False
2.1.3 False
2.1.4 True
2.1.5 True
(5 × 1) (5)

2.2 A special vacuum cleaner can be used when cleaning parts made of asbestos. (1)

2.3 Overheating, ✓ Incorrect bolt/nut torque or loose bolts/nuts✓ (2)

2.4
- It can crack.
- It can snap.
- It can turn lose (Any two) (2)

2.5
2.5.1 Structural defects are caused when incorrect or faulty materials are used.

2.5.2 Design errors occur during the design of the component.

2.5.3 Friction is the resistance that prevent one surface to slide or roll easily over another.

2.5.4 Scrutinising means examining something carefully.

2.5.5 Vibration is a continuous slight shaking motion.
(5 × 1) (5)

2.6 Tag the component✓ and record the tagged components with instructions on it saying when it should be tested again.✓ (2)

2.7
- Heavy loads will cause a defective cast to crack. ✓
- Heavy loads will cause a defective cast to break. ✓ (2)

2.8
- Misalignment of components
- Coupling runner imbalances
- Coupling wear
- Worn drives belts
- Stiff machine mounting
- Misaligned gears
- Overloaded bearing (7)

**[26]**

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## QUESTION 3

3.1
- Use the correct personal protective equipment.
- Do not wear jewellery or neckties and tie back hair if it is long.
- Understand all hazard and warning signs in the workplace.
- Never operate a machine not trained and authorised to use or maintain.
- Check that there are no obstructions or hazards on the floor.

(Any suitable answer) (5)

3.2
- Cutting speed
- Feed rate (2)

3.3
- While the machine is running, ✓ keep on checking how much material is being used. ✓
- Replace materials as the level drops✓ so that the machine does not run out of material and bring production to stop. ✓ (2 × 2) (4)

**[11]**

## QUESTION 4

4.1 Cold saw (cut machine) ✓ (1)

4.2
- Band saw horizontal or vertical
- Power saw
- Gas cutting using oxygen and acetylene
- Plasma cutting
- Laser cutting (5)

4.3
- Mist lubricating system
- Flood lubricating system (2)

4.4
- They lubricate the workpiece.
- They lubricate the cutting tool so that it produces a smooth surface.
- They reduce the amount of energy used.
- They protect the machine surfaces.
- They reduce friction and wear.
- Serve as a coolant (6)

4.5 Start by setting the cutting✓ and preparing the feed speed✓ or make pressure adjustments.✓ After doing that, check that the saw blades suit the material that needs to be cut.✓ (4)

4.6 4.6.1 The job selector adjusts the settings✓ on the machines to suit the materials being cut. ✓

4.6.2 A control valve controls the flow of the lubricant✓ during the cutting operation✓

(2 × 2) (4)

4.7
- Adjust the lubricant.
- Perform the cutting operation.
- Confirm blade clearance.
- Cut edges to conform to job specification. (4)

**[26]**

**QUESTION 5**

5.1 The input display panel allows one to enter the data✓ for the components to be manufactured. ✓ (2)

5.2
- Contour milling
- Drilling
- Pocket milling
- Reaming (4)

5.3 Check the graphic of the completed components.✓ and see if they satisfy the design requirements.✓ If they do not, edit the program.✓ This can be done a few times before using it.✓ (4)

5.4
- x – axis is the cross feed
- y – axis is in the feed
- z- axis is parallel to the tool axis (3)

5.5
- x – axis is across the table
- y – axis is down
- z- axis is out (3)

**[16]**

**QUESTION 6**

6.1
- To see if the joint is smooth✓ and blends in with the rest of the component✓
- To see if the joint✓ sticks out and looks ugly✓ (2 × 2) (4)

6.2
- What is the fatigue point?
- How ductile is the material?
- Can the tension of the joined material be drawn into the wire?
- How much will it deform if compressed?
- How much pressure or weight can it take before it deforms? (5)

6.3 Pressurised the pipe✓ and check for leaks by using water and soap. ✓ (2)

6.4 6.4.1 Proper ventilation is very important✓ as poor ventilation affects concentration and can lead to drowsiness. ✓

6.4.2 Proper functioning of lifting equipment ✓ are very important because if the items are lifted and fall on a worker it might lead to serious injuries or even death. ✓

(2 × 2) (4)

**[15]**

**TOTAL: 100**

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