



# higher education & training

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Department:  
Higher Education and Training  
**REPUBLIC OF SOUTH AFRICA**

## **MARKING GUIDELINE**

**NATIONAL CERTIFICATE (VOCATIONAL)**

**WELDING  
NQF LEVEL 4**

**22 November 2024**

**This marking guideline consists of 5 pages.**

**QUESTION 1**

- 1.1      1.1.1      A✓✓  
             1.1.2      B✓✓  
             1.1.3      A✓✓  
             1.1.4      A✓✓  
             1.1.5      D✓✓
- (5 × 2)      (10)
- 1.2      • Do not touch live electrical wires. ✓  
             • Wear dry, hole-free insulating gloves and body protection. ✓  
             • Do not use AC output in damp areas if there is danger of the equipment falling. ✓  
             • Properly install, ground and operate the welding equipment according to the manufacturer's manual as well as national and international safety codes. ✓  
             • Turn off all equipment if you are not using it. ✓  
             • Make sure that equipment cables are not worn or damaged. ✓  
             • Use only well-maintained equipment. ✓
- (Any 5 × 1)      (5)
- 1.3      • The ends of the pipes must be parallel✓  
             • Remove grease and paint from the inside and outside of welding area✓  
             • Ensure that the groove angle is sufficient✓  
             • The welded area must be free from moisture✓  
             • Tack weld the pipes in the correct position✓
- (5)  
**[20]**

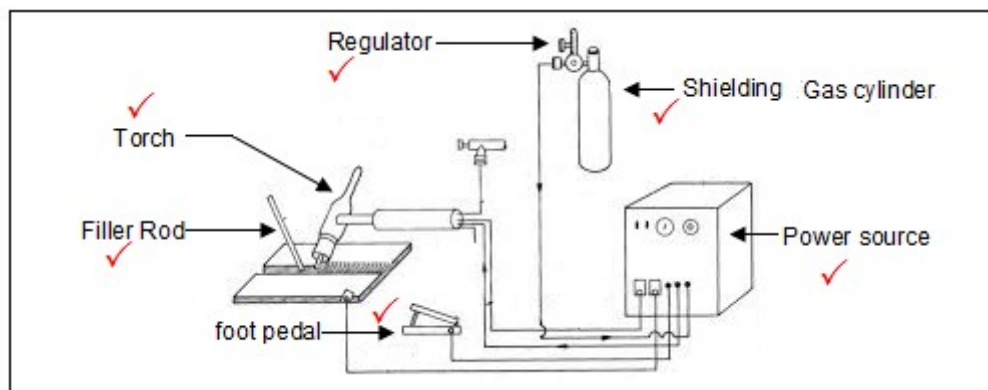
**QUESTION 2**

- 2.1      • Chipping hammers✓  
             • Files✓  
             • Clamps✓  
             • Wire brushes✓  
             • Squares✓
- (5)
- 2.2      2.2.1      A – Welding helmet✓  
                             B – Ear muffs✓  
                             C – Breathing respirator/Respirator✓  
                             D – Skull cap/Cap/Welding cap ✓  
                             E – Safety boots✓
- (5)
- 2.2.2      A – Prevents arc rays from damaging eyes/prevents arc eyes✓  
                             B – Prevents hearing loss/blocks out noise ✓  
                             C – Prevents one from inhaling harmful fumes✓  
                             D – Prevents hot pieces of metal from burning one's head ✓  
                             E – Protects feet from hot and sharp objects✓
- (5)

- 2.3
- Check the thickness of the pipe, which will determine the size of the electrode and the current to be used✓
  - Ensure the area to be welded is clean✓
  - Ensure that the pipe does not contain flammable substances✓
  - Ensure that the groove angle is correct/sufficient✓
  - Ensure that the pipe is stable✓

(5)  
[20]**QUESTION 3**

3.1

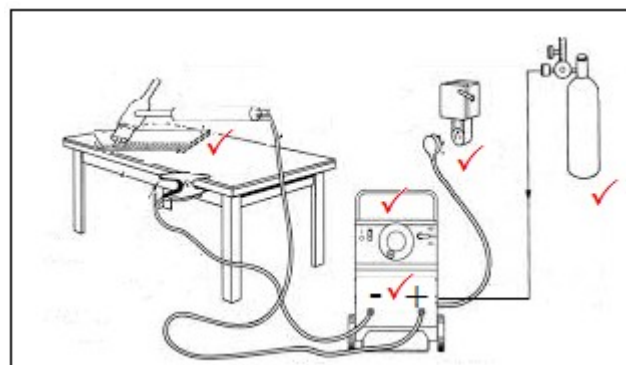


(6)

- 3.2 The welding area is in an upright position.✓ The weld is usually started at the bottom of the joint with the filler rod added from above.✓ The travelling direction is upwards.✓ With this position a previous dab of filler metal solidifies✓ and becomes support for the next filler metal dab to rest on.✓

(5)

3.3



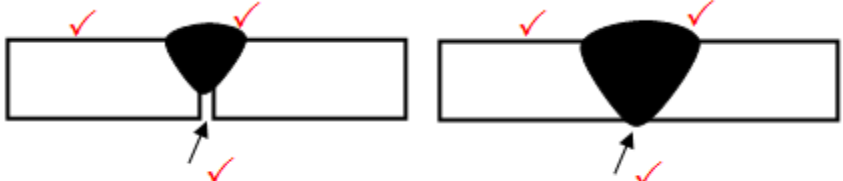
(5)

- 3.4
- A Pressure gauge✓
  - B Cylinder valve✓
  - C Cylinder✓
  - D Pressure regulator✓

(4)  
[20]

**QUESTION 4**

- 4.1
- Ensure that the cylinders are chained✓
  - Do not store cylinders in areas of excessive heat✓
  - Store cylinders in an up-right position✓
  - Empty cylinders must be stored separately✓
  - Do not store cylinders in areas of excessive vibration✓
  - Do not store cylinders in areas exposed to electrical circuits✓
  - Store cylinders in a dry, ventilated area✓
- (Any 5 × 1) (5)

- 4.2
- 
- Lack of penetration** **Good Penetration**
- (6)

- 4.3
- Pure tungsten✓
  - Ceriated✓
  - Lanthanated✓
  - Zirconiated✓
  - Thoriated✓
- (5)

- 4.4
- 4.4.1 Inclined position✓
- 4.4.2 Horizontal rolled✓
- 4.4.3 Vertical position✓
- 4.4.4 Horizontal fixed✓
- (4 × 1) (4)
- [20]**

**QUESTION 5**

- 5.1
- Poor penetration✓
  - Irregular bead shape✓
  - Excessive spatter✓
  - Overheating✓
  - Difficulty in controlling the arc✓
- (5)
- 5.2
- The alloy used to produce the wire electrode✓
  - The thickness of the material that needs to be welded✓
  - The welding position✓
  - What happens to the gas when it comes into contact with the molten weld pool✓
  - How the gas transfers heat✓
  - The cost of the gas✓
- (Any 5 × 1) (5)

- 5.3
- Thickness of metal✓
  - Type of metal✓
  - Type of joint✓
  - Welding position✓
  - Type of shielding gas✓
  - Wire diameter✓
  - Wire feed speed✓
- (Any 5 × 1) (5)
- 5.4 Switch off the machine at the power supply and unplug the power cable.✓  
Turn all dials and knobs to the off position.✓ Turn off the shielding gas supply by  
closing the valve on the gas cylinder.✓ Roll up the cables and hoses.  
Store the cylinder away from flammable materials.✓ All tools must be stored in  
a tool/carboard box.✓
- (5)  
[20]
- TOTAL: 100**