higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

NATIONAL CERTIFICATE (VOCATIONAL)

WELDING
NQF LEVEL 4

(6031034)

22 November 2024 (X-paper)
09:00–12:00

This question paper consists of 6 pages.

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DEPARTMENT OF HIGHER EDUCATION AND TRAINING
REPUBLIC OF SOUTH AFRICA

NATIONAL CERTIFICATE (VOCATIONAL)
WELDING
NQF LEVEL 4
TIME: 3 HOURS
MARKS: 100

INSTRUCTIONS AND INFORMATION

1. Answer all the questions.
2. Read all the questions carefully.
3. Number the answers according to the numbering system used in this question paper.
4. Use only a black or blue pen.
5. Write neatly and legibly.

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QUESTION 1

1.1 Various options are given as possible answers to the following questions. Choose the answer and write only the letter (A–D) next to the question number (1.1.1–1.1.5) in the ANSWER BOOK.

1.1.1 Property of aluminium alloys:

A High corrosion resistance
B Rusts easily
C Non-electrical conductivity
D Heavy

1.1.2 A group of stainless steel:

A Chromium
B Martensitic
C Nickel
D Tungsten

1.1.3 Gives hardness and roughness to steel:

A Chromium
B Martensitic
C Nickel
D Tungsten

1.1.4 Type of backing gas

A Pure argon
B Oxygen
C Carbon dioxide
D Liquefied-petroleum gas

1.1.5 AWS refers to …

A American Welding Society.
B African Welding Standard.
C African Welding Society.
D American Welding Standard.

(5 × 2) (10)

1.2 Electrocution is a major safety hazard and in order to be safe when welding you need to know how to avoid it.

List FIVE precautions to be taken that can prevent electrocution in the welding workshop. (5)

1.3 List FIVE tasks to be performed when preparing a pipe before welding can take place. (5)

[20]

QUESTION 2

2.1 Hand tools are used by welders to complete their work and to improve the quality of the final weld product. Name FIVE different hand tools used by welders. (5)

2.2 FIGURE 1 below shows different types of safety equipment.

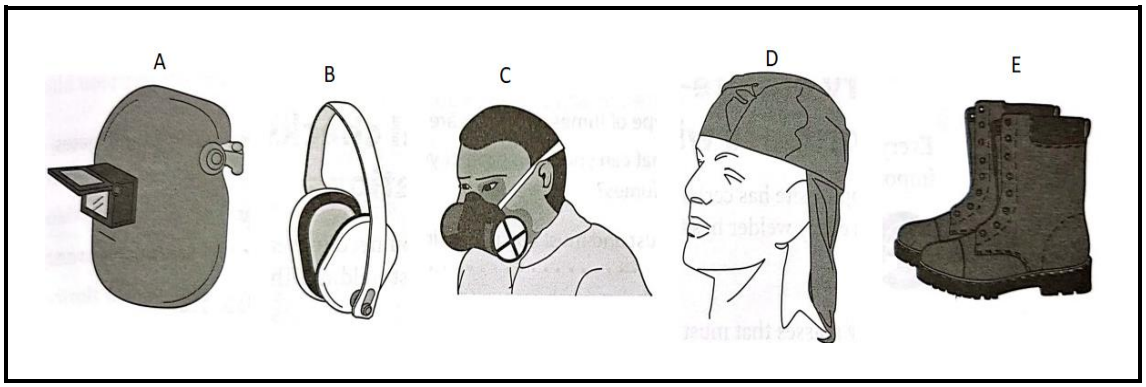


FIGURE 1

2.2.1 Name the different safety equipment by writing only the answer next to the letter (A–E) in the ANSWER BOOK. (5)

2.2.2 Give ONE function of each of the safety equipment. (5)

2.3 Name FIVE pre-checks to be done on a pipe before starting the with shielded metal arc welding (SMAW) process. (5)
[20]

QUESTION 3

3.1 Draw and label a set-up showing the equipment used for the gas tungsten arc welding (GTAW) process.

Show the regulators, shielding gas cylinder, power source, filler rod, torch and foot pedal. (6)

3.2 Explain the vertical welding position carried out during the gas tungsten arc welding (GTAW) process. (5)

3.3 Draw the direct current electrode positive (DCEP) set-up used for gas tungsten arc welding (GTAW). (5)

3.4 FIGURE 2 below shows a gas-cylinder assembly. Name the labelled items by writing only the answer next to the letter (A–D) in the ANSWER BOOK. (4)

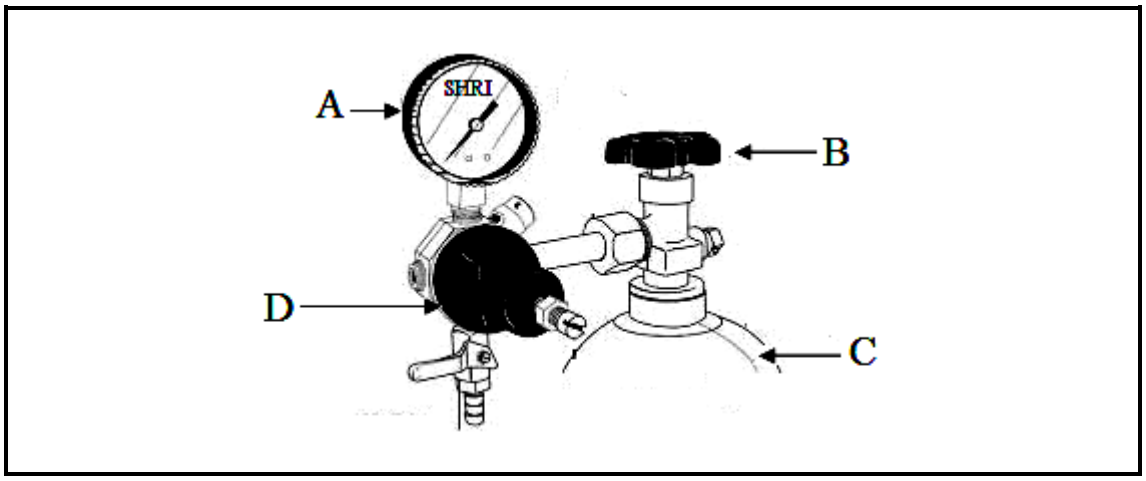


FIGURE 2

[20]

QUESTION 4

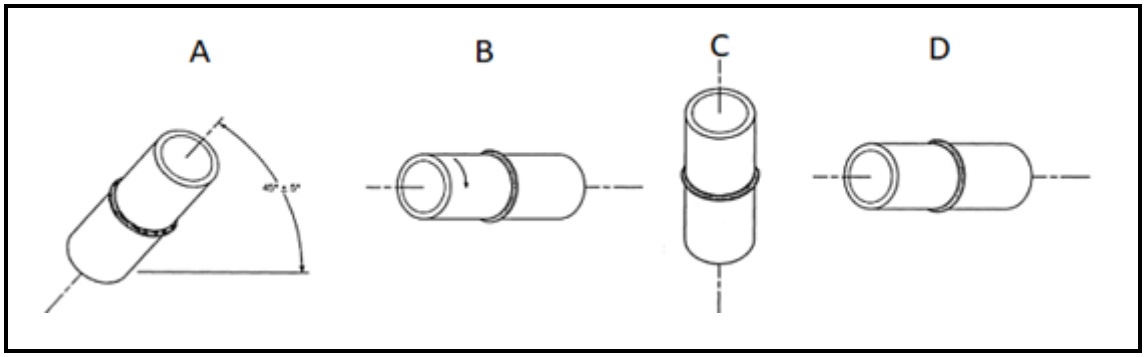
4.1 List FIVE safety precautions to be adhered to when storing gas cylinders. (5)

4.2 With the aid of TWO neat sketches, show the difference between *lack of penetration* and *good penetration* of a weld. (6)

4.3 List FIVE types of electrodes used for gas tungsten arc welding (GTAW). (5)

4.4 FIGURE 3 below shows different welding positions used for the welding of pipes.

Name the welding positions by writing only the answer next to the letter (A–D) in the ANSWER BOOK.



(4)

FIGURE 3

[20]

QUESTION 5

5.1 Selecting the correct polarity for metal inert gas (MIG) welding has a huge effect on the quality and strength of the weld.

(5)

List FIVE results of selecting the incorrect polarity.

5.2 List FIVE factors that must be taken into consideration when choosing a shielding gas to use in the metal inert gas (MIG) welding process. (5)

5.3 The voltage and amperage required for a weld depend on many factors.

List FIVE factors. (5)

5.4 Explain how welding equipment used for metal inert gas (MIG) welding should be shut down and stored. (5)

[20]

TOTAL 100

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