higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

NATIONAL CERTIFICATE (VOCATIONAL)

WELDING
NQF LEVEL 4

(6031034)

17 November 2022 (X-paper)
09:00–12:00

This question paper consists of 6 pages.

525Q1N2217

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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. Start each section on a new page.
5. Use only a blue or black pen.
6. Write neatly and legibly.

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QUESTION 1

Choose an item from COLUMN B that matches a description in COLUMN A. Write only the letter (A–N) next to the question number (1.1–1.10) in the ANSWER BOOK.

COLUMN A		COLUMN B	
1.1	The specification for pipe sizes is given as this	A	covered electrode
1.2	The polarity cannot be changed on this	B	water cooler
1.3	A weld deposit produced by a single weld pass	C	axis of the weld
1.4	The type of electrode used for shielded metal arc welding	D	outside diameter
1.5	An additional piece of equipment that may be used for gas metal arc welding	E	alternating current welding machines (AC)
1.6	An imaginary line drawn parallel to the weld bead through the centre of the weld	F	weld bead
1.7	This method is used to check for defects in weld	G	welding
1.8	A simple and easy way to join sections of pipes	H	shielded metal arc welding
1.9	The most common welding process used for joining pipes and plates	I	filler metals
1.10	The material that is added to fill the space between two joints	J	macro-etch
		K	inside diameter
		L	direct current (DC) welding machines
		M	fillet weld
		N	non-consumable electrode

(10 × 1) **[10]**

QUESTION 2

2.1 Make a neat, labelled drawing of the shielded metal arc welding (SMAW) process, and include the following in your drawing:

Electrode wire; electrode; shielding gas area; slag; solidified metal; molten metal

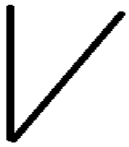
(8)

2.2 List FOUR components that make up a SMAW unit. (4)

2.3 A welder is required to read welding drawings to determine the type of weld that is required.

Name the following welding symbols used on a groove or butt joint:

2.3.1 

2.3.2 

2.3.3 

2.3.4 

2.3.5 

(5 × 2) (10)

2.4 List THREE hazards that a welder must be aware of while doing SMAW.

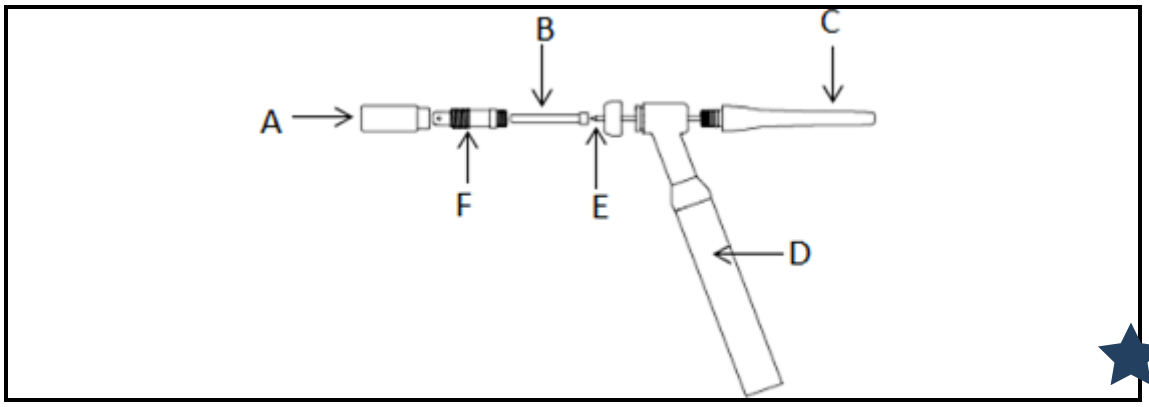
(3)
[25]

QUESTION 3

3.1 List FIVE advantages of tack welding two sections of pipes before final welding can take place. (5)

3.2 Name FOUR types of electrodes used for tungsten inert gas welding (TIG). (4)

3.3 The FIGURE below shows a welding torch used for TIG. Label the diagram by writing the answer next to the letter (A–F) in the ANSWER BOOK.



(6 × 1) (6)

3.4 Name FIVE components that make up the gas tungsten arc welding setup. (5)

3.5 With a neatly labelled drawing, explain the direct current electrode negative setup for gas tungsten arc welding. (5)
[25]

QUESTION 4

4.1 Explain how gas cylinders used for gas tungsten arc welding or TIG welding must be dismantled and stored away after use. (5)

4.2 Give FIVE disadvantages of gas tungsten arc welding. (5)

4.3 Describe the welding characteristics of austenitic stainless steel. (5)

4.4 Explain why the aluminium oxide coating needs to be removed before welding can take place. (5)

4.5 List FIVE components in the MIG welding unit. (5)
[25]

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QUESTION 5

5.1 A welder must check and make the necessary adjustments to equipment before any welding can take place.

List FIVE checks or adjustments that must be done on MIG welding equipment. (5)

5.2 Explain the MIG welding process. (5)

5.3 List FIVE advantages of MIG welding. (5)

[15]

TOTAL: 100

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