higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

NATIONAL CERTIFICATE (VOCATIONAL)

WELDING
NQF LEVEL 2

(6031012)

17 November 2022 (Y-paper)
13:00–16:00

This question paper consists of 7 pages.

523Q1N2217

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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 black or blue pen.
6. Write neatly and legibly.

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QUESTION 1

1.1 Choose a term from COLUMN B that matches a description in COLUMN A. Write only the letter (A–H) next to the question number (1.1.1–1.1.5) in the ANSWER BOOK.

COLUMN A		COLUMN B	
1.1.1	Ability of a metal to weld easily	A	stainless steel
1.1.2	The most common metal which is easy to weld by welding novices	B	fume extraction
1.1.3	Need for adequate ventilation	C	weldability
1.1.4	Caused by absorption of atmospheric gases from arc	D	magnetic arc blow
1.1.5	Deflection of electric arc during SMAW process	E	mild steel
		F	earplug
		G	blow through
		H	porosity

(5 × 1) (5)

1.2 FIGURE 1 below shows welding symbols used in the fabrication industry. Give the names of the components labelled 1.2.1–1.2.4. Write only the correct answer next to the question number (1.2.1–1.2.4) in the ANSWER BOOK.

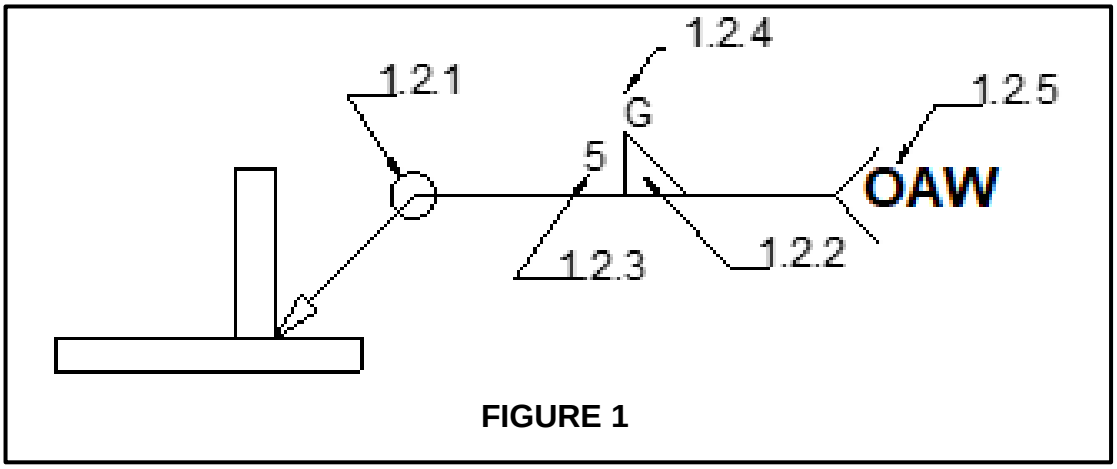


FIGURE 1

(4)

1.3 Name the welding process labelled 1.2.5. (1)

[10]

QUESTION 2

2.1 State ONE welding position that is used to create welds during SMAW. ☆ (1)

2.2 The AWS Standard list covered electrodes with an "E" in front, for example E7016. Give TWO other AWS standard electrodes and give the usage of each electrode. (4)

2.3 Give TWO advantages of the weaving technique during stick welding. (4)

2.4 2.4.1 Name and give the uses of TWO basic welding hand tools used in MMA. (4)

2.4.2 State the name of ONE type of earth clamp. (1)

2.5 SMAW uses flux-coated electrodes. ☆

2.5.1 Illustrate with a neat, well-labelled sketch a typical SMAW electrode. (3)

2.5.2 Explain why an electrode tip, at the end, is without flux. (2)

2.6 SMAW electrodes are produced with different flux coatings to be used on different types of metals.

2.6.1 Explain *rutile*. (2)

2.6.2 Differentiate between a *rectifier* and a *transformer*. (4)

[25]

QUESTION 3

3.1 FIGURE 2 below shows a high-pressure gas-welding regulator. Name the components labelled 3.1.1–3.1.4. Write only the answer next to the question number (3.1.1–3.1.4) in the ANSWER BOOK. ☆

☆



FIGURE 2 (4)

3.2 Explain how a leakage test is carried out on gas-welding fittings. (2)

3.3 Explain FOUR effects of neglecting gas-leakage tests on a gas-welding plant. (4)
[10]



QUESTION 4

4.1 Explain the terminology below that relates to a high-pressure gas cutting process:

4.1.1 Bevelling

4.1.2 Backfire

4.1.3 Draglines

4.1.4 Kindling temperature

4.1.5 Purge (10)



4.2 List FOUR preoperational checks on a gas-cutting rig. (4)

4.3 Describe how an oxy-acetylene cutting process is done on a 10 mm thick mild steel plate. (5)

4.4 Explain TWO safety hazards in a gas-cutting environment. (4)

4.5 Explain TWO proper storage principles of oxy-acetylene cylinders. (2)
[25]



QUESTION 5

5.1 FIGURE 3 below shows a typical MIG torch. Name the torch components labelled 5.1.1–5.1.5. Write the NAME and FUNCTION of each component next to the question number (5.1.1–5.1.4) in the ANSWER BOOK.

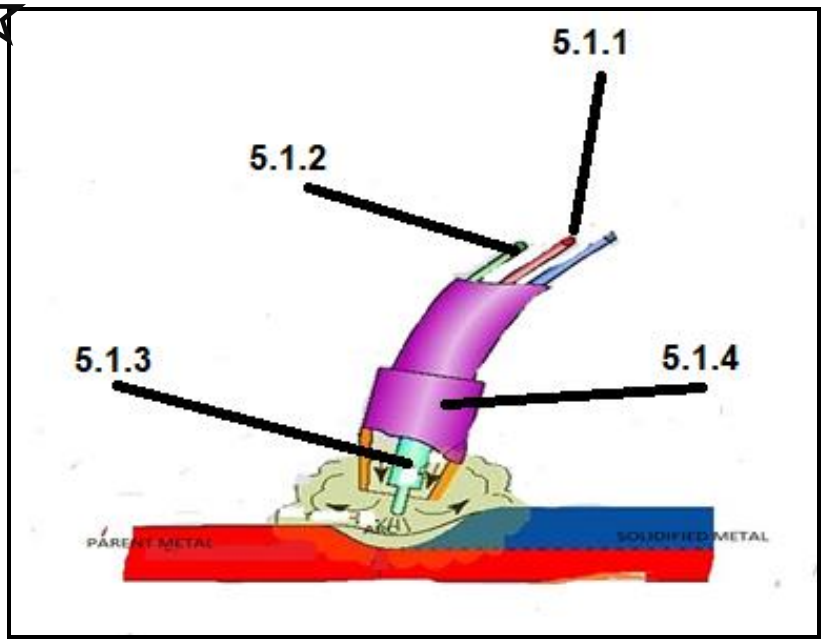


FIGURE 3 (8)

5.2 Explain the importance of shielding gas used for GMAW. (2)

5.3 There are FOUR basic metal transfer methods in GMAW.

5.3.1 Illustrate with a labelled sketch the globular metal transfer MIG welding process. (4)

5.3.2 Explain the term *stick out*. (2)

5.4 Explain TWO consequences of a MIG welder that is incorrectly assembled. (4)

[20]

QUESTION 6

6.1 A welder has to braze weld two pieces of metal with a lap joint. Explain the process step-by-step. (3)

6.2 State TWO problems associated with wrong regulator pressure on brazing equipment. (3)

6.3 Study FIGURE 4 below and answer the following questions.



FIGURE 4

6.3.1 State TWO safety precautions that are being observed by the artisan in FIGURE 4.

6.3.2 Recommend TWO other safety precautions that the artisan in the photo must observe. **(4)**

[10]

TOTAL: 100

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