higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

NATIONAL CERTIFICATE (VOCATIONAL)

WELDING
NQF LEVEL 2

(6031012)

22 November 2024 (Y-paper)
13:00–16:00

This question paper consists of 5 pages.

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DEPARTMENT OF HIGHER EDUCATION AND TRAINING
REPUBLIC OF SOUTH AFRICA

NATIONAL CERTIFICATE (VOCATIONAL)
WELDING
NQF LEVEL 2
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: PERSONAL PROTECTIVE EQUIPMENT

1.1 State FIVE items of personal protective equipment that are used in a metal fabrication environment. (5)

1.2 Explain the purpose of TWO of the items mentioned in QUESTION 1.1.1. (4)

1.3 State ONE piece of equipment used in firefighting. (1)
[10]

QUESTION 2: SHIELDED METAL ARC WELDING

2.1 Chemical and mechanical processes that occur in shielded metal arc welding

2.1.1 Explain the mechanical processes that take place in stick welding. (3)

2.1.2 Explain the chemical processes that take place in manual metal arc welding. (3)

2.2 State a welding position that is commonly used in elementary welding. (1)

2.3 Workshop conditions are critical for safety of all welding personnel at all times.

2.3.1 State TWO unsafe workshop conditions that are found in a fabrication environment.

2.3.2 Explain the consequences of welding mild steel under unsafe conditions.
(2 × 2) (4)

2.4 Compare the characteristics of *low carbon* steel and *high carbon* steel in the general structural welding processes. (4)

2.5 Explain the functions of TWO major components of a manual metal arc welding machine. (4)

2.6 Recommend the size of the electrode to be used for welding a low-carbon steel plate of 3 mm to a novice in welding. Substantiate your recommendation. (4)

2.7 Explain the term, *electrode manipulation*. (2)
[25]

QUESTION 3: OXY-ACETYLENE WELDING

3.1 Show by means of TWO labelled sketches, the cylinders used for storage of high-pressure welding gas. Indicate the colour of each cylinder as well. (8)

3.2 Compare types of closing and opening mechanisms in cylinders. (3)
[11]

QUESTION 4 : GAS CUTTING

4.1 Explain the following terminology:

4.1.1 Fuel

4.1.2 1800 kPa

4.1.3 HAZ

4.1.4 Blowpipe

4.1.5 Kindling temperature

(5 × 2) (10)

4.2 Summarize the steps in the gas cutting process. (6)

4.3 Gas cutting hazards

4.3.1 State THREE hazards associated with gas cutting. (3)

4.3.2 State a preventive measure for each of the hazards mentioned in QUESTION 4.3.1. (3)

4.4 State TWO features that differentiate a *cutting torch* from a *welding torch*. (2)
[24]

QUESTION 5: GAS METAL ARC WELDING

5.1 State SEVEN components that make up an MIG welding plant. (7)

5.2 State THREE protective gases used in gas metal arc welding. (3)

5.3 State THREE inspection methods that are used on GMAW welds. (3)

5.4 State the features of a MIG welding torch. (2)

5.5 Explain TWO potential causes of defects in MIG welding. (4)

5.6 Explain the importance of shielding gas in MIG welding. (2)
[21]

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QUESTION 6: GAS BRAZING

6.1 The quality of a braze or a braze joint is made up of a few elements. State THREE of these elements. (3)

6.2 Describe safety precautions that are associated with a brazing rig. (6)
[9]

TOTAL: 100

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