higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

# NATIONAL CERTIFICATE (VOCATIONAL)

## WELDING
## NQF LEVEL 3

(6031033)

**10 March 2020 (X-paper)**
**09:00–12:00**

**This question paper consists of 5 pages.**

417Q1S2010

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**TIME: 3 HOURS**
**MARKS: 100**

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**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 question 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 List SIX causes of porosity during welding. (6)

1.2 Give FOUR advantages of shielded metal arc welding (SMAW). (4)
**[10]**

## QUESTION 2

2.1 Indicate whether the following statements are TRUE or FALSE by writing only 'True' or 'False' next to the question number (2.1.1–2.1.5) in the ANSWER BOOK.

2.1.1 Oxygen creates a layer of oxide when aluminium is welded.

2.1.2 Flux increases the viscosity of the weld metal.

2.1.3 Slag creates a blanket that protects the weld from air.

2.1.4 Hydrogen causes cracks in the weld.

2.1.5 Oxygen is helpful during the welding of steel workpieces.

(5 × 1) (5)

2.2 Why are electrodes baked before use? (2)

2.3 State THREE things that will happen if welding drawings are interpreted incorrectly. (3)

2.4 List FIVE steps to consider when performing a weld in shielded metal arc welding (SMAW). (5)

2.5 List THREE welding defects that can occur in shielded metal arc welding (SMAW). (3)

2.6 Explain how a penetrant fluid test is performed. (7)
**[25]**

## QUESTION 3

3.1 State THREE functions of a pressure regulator in oxy-acetylene welding. (3)

3.2 Give the uses of each of the following oxy-acetylene flames:

3.2.1 Carburising flame (2)

3.2.2 Neutral flame (1)

3.2.3 Oxidising flame (1)

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3.3 State THREE inspections that must be done on a workpiece before welding. (3)

3.4 State THREE inspections that must be done on a completed workpiece. (3)

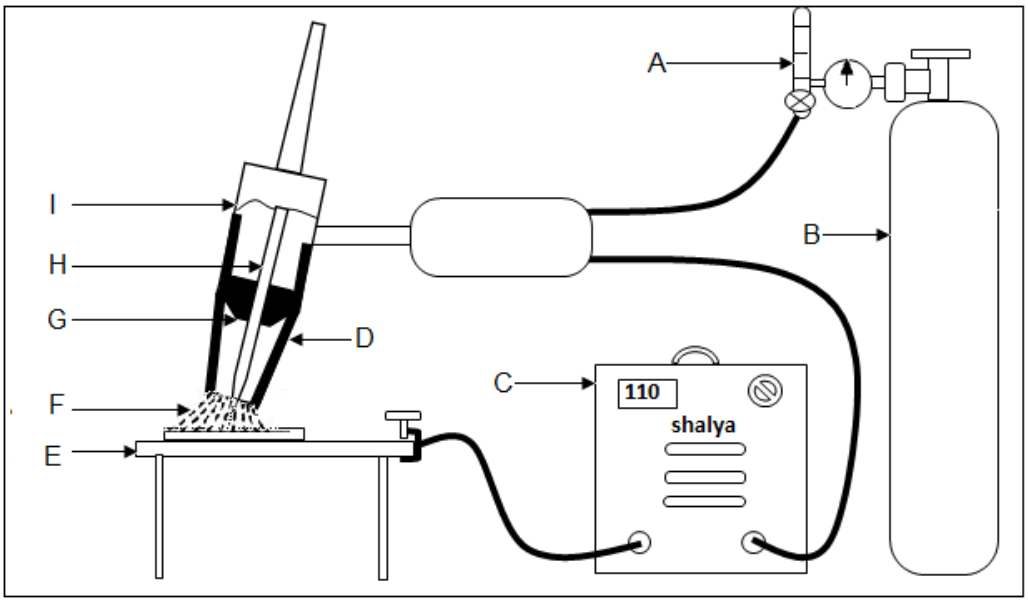
3.5 List FIVE defects that can be found in oxy-acetylene welding. (5)

3.6 How often must oxy-acetylene equipment be inspected? (2)

**[20]**

**QUESTION 4**

4.1 Shown below is gas tungsten arc welding (GTAW) equipment.




Label each component by writing the answer next to the letter (A–I) in the ANSWER BOOK. (9 × 1) (9)

4.2 State the meaning of each of the following terms associated with gas tungsten arc welding:

4.2.1 Manual welding (2)

4.2.2 Semi-automatic welding (2)

4.2.3 Automatic welding (3)

4.3 List SIX guidelines for setting up gas tungsten arc welding (GTAW). (6)

4.4 List THREE functions of tack welds in gas tungsten arc welding (GTAW). (3)

**[25]**

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## QUESTION 5

5.1 List FOUR challenges that must be overcome to achieve a high-quality weld during metal inert gas welding (MIG). (4)

5.2 Calculate the amperage required to weld an 8 mm plate.

**HINT:** 0,0254 mm = 1 A (5)

5.3 Give FIVE reasons why it is important to clean and store welding equipment after you are done for the day. (5)

5.4 State why the pull-technique method is preferred during metal inert gas welding (MIG). (2)

5.5 List the FOUR inspection methods done by a welding inspector to check a welded workpiece. (4)

**[20]**

**TOTAL: 100**

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