higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

NATIONAL CERTIFICATE (VOCATIONAL)

ENGINEERING FABRICATION
NQF LEVEL 2
(First paper)

(6031002)

28 November 2023 (Y-paper)
13:00–15:00

Calculators may be used.

This question paper consists of 6 pages.

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ENGINEERING FABRICATION
NQF LEVEL2
(First paper)
TIME: 2 HOURS
MARKS: 75

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. Clearly cross out all work you do not want to be marked.
5. Use only a black or blue pen.
6. Write neatly and legibly.

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SECTION A

QUESTION 1

1.1 Indicate whether the following statements are TRUE or FALSE by writing only 'True' or 'False' next to the question number (1.1.1–1.1.5) in the ANSWER BOOK.

1.1.1 When you wear PPEs, you must remember to keep your pockets buttoned and your pant legs outside your boots.

1.1.2 When soft material is cut with a hacksaw, a fine-teeth blade must be used.

1.1.3 A plain forming machine consists of four rollers.

1.1.4 To develop pyramids and cones, the radial-line method must be used.

1.1.5 Never bend sheet metal over a sharp edge as it will cause the metal to crack.

(5 × 1) (5)

1.2 Choose a term from COLUMN B that matches a description in COLUMN A. Write only the letter (A–E) next to the question number (1.2.1–1.2.5) in the ANSWER BOOK.

	COLUMN A		COLUMN B
1.2.1	Mean diameter	A	one of the developmental methods
1.2.2	Bevel gauges	B	tool used to bend metal
1.2.3	Circumference	C	shut-off cylinder valve
1.2.4	Hand seamer	D	also called the effective or neutral diameter
1.2.5	Emergency shut down	E	used to mark off angles
			ΠxDm

(5 × 1) (5)
[10]

TOTAL SECTION A: 10

SECTION B

QUESTION 2

2.1 List FOUR advantages of using templates. (4)

2.2 In engineering, various terms are used.

Define *scaling up.* (2)

2.3 Determining allowances for marking off is vital in fabrication. This will assist in determining the correct size of sheet metal to be cut.

State THREE reasons why allowances should be made in fabrication. (3)

2.4 Ziggies Fabricators made a 24-mm mild-steel tank with a height of 9 m and an outside diameter of 23 m.

2.4.1 Calculate the inside diameter of the tank. (2)

2.4.2 Calculate the mean diameter of the tank. (2)

2.4.3 Calculate the volume of the tank in m^3. (3)

[16]

QUESTION 3

3.1 A bar folder, a cornice brake press, and a forming and rolling machine are examples of the bending and forming machines that boilermakers use in a fabrication workshop.

Arrange the above-mentioned machines according to:

3.1.1 Forming machines.

3.1.2 Bending machines.

(2 × 2) (4)

3.2 A slip-roll forming machine operates in the same way as a plain forming machine.

State ONE main difference between a slip-roll forming machine and a plain forming machine. (2)

3.3 The purpose of selecting safe and appropriate tools to work with, is to be safe at all times.

State THREE golden rules for the use of tools. (3)

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3.4 A beading machine is one of the most used machines in sheet metal work.

3.4.1 On which shapes of objects is a beading machine mostly used? (1)

3.4.2 Name TWO purposes for which a beading machine is mostly used. (2)

3.5 In sheet metal construction, a variety of methods is used for joining the edges of metals (seaming). The mechanical seam is used when joining light- to medium-gauge metal.

Name THREE method of joining heavier metals. (3)

3.6 Name ONE joint commonly used on light material with the aid of a hand groover. (1)

[16]

QUESTION 4

4.1 'X' - Oxidising flame



The figures above represent the three flame types in an oxy-acetylene plant. The first flame, marked 'X', is an oxidising flame.

4.4.1 Name the flames marked A and B. (2)

4.4.2 Which ONE of the above flames is preferred for pre-heating? (1)

4.2 Use the table below to differentiate between an *oxygen regulator* and an *acetylene regulator*:

Item	Acetylene regulator	Oxygen regulator
Thread direction	4.2.1	4.2.2
Colour	4.2.3	4.2.4

(4)

4.3 Boilermakers highly rely upon the oxy-acetylene cutting process to cut and bevel thick material.

State TWO main functions of a regulator. (2)

4.4 A flashback arrestor is also part of the assembly of oxy-acetylene equipment.

State the main function of a flashback arrestor. (2)

4.5 After a material has been cut, the quality of the cut must be assessed. The torch speed and flame adjustment are key to the quality of a cut.

What would happen if the:

4.5.1 Cutting speed is too low?

4.5.2 Cutting speed is too high?

(2 × 2) (4)

4.6 Oxy-acetylene equipment is not fully dismantled after finishing a gas cutting task because it would take too much time to reassemble it.

State TWO cases when oxy-acetylene equipment has to be dismantled. (2)
[17]

QUESTION 5

5.1 List the THREE principal types of power saws. (3)

5.2 Name the power saw that matches the following description: back and forth movement. (1)

5.3 The above-mentioned power saw requires cutting fluid.

State THREE reasons why cutting fluid is necessary. (3)

5.4 Maintaining the correct posture while cutting is a safety standard.

State THREE reasons why one should maintain the correct posture while using a power saw. (3)

5.5 When cutting metals, rough edges and burs will remain.

List FOUR tools or types of equipment that could be used to remove rough edges or burs. (4)

5.6 Differentiate between *dry abrasion* and *wet abrasion*. (2)
[16]

TOTAL SECTION B: 65
GRAND TOTAL: 75

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