higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

NATIONAL CERTIFICATE (VOCATIONAL)

ENGINEERING FABRICATION

(First paper)

NQF LEVEL 2

(6031002)

11 March 2020 (Y-paper)
13:00–15:00

REQUIREMENTS: Drawing instruments

Calculators may be used.

This question paper consists of 5 pages.

475Q1S2011

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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. Use only a black or blue pen.
5. All work you do not want to be marked, must be crossed out clearly.
6. Write neatly and legibly.

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QUESTION 1

Indicate whether the following statements are TRUE or FALSE by writing only 'True' or 'False' next to the question number (1.1–1.6) in the ANSWER BOOK.

1.1 Never bend rods or wires in the bending brake.

1.2 A mild steel plate is ductile and brittle.

1.3 Malleability refers to the metal property which allows a metal to be hammered or drawn into wires.

1.4 When using coolant, the life of a blade is extended.

1.5 When using coolant, swarf is carried into the work area.

1.6 Templates are always used as patterns in the fabrication workshop.

(6 × 1) **[6]**

QUESTION 2

2.1 In the boilermaking workshop, boilermakers highly rely on the use of templates and patterns in the fabrication of various items.

Differentiate between a *template* and a *pattern* in terms of their usage. (3)

2.2 During the fabrication process, boilermakers use different methods to develop required patterns.

Name THREE different developmental methods that boilermakers use. (3)

2.3 When boilermakers fail to achieve the required measurements, they keep to given tolerances.

Define the term *tolerance.* (2)

2.4 Make a neat, labelled sketch to show how a template is used to mark holes on a channel iron.

HINT: Show the centre line on the channel and the notches in line with the centre line. (3 × 2) (6)

[14]

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QUESTION 3

3.1 Mathatho construction fabricated a 4-metre-high mild steel tank using a 16 mm thick plate for the tank to store water. The tank has an inside diameter of 1 205 mm.

Calculate the following:

3.1.1 Mean diameter of the tank (3)

3.1.2 Length of the plate used in the fabrication of the tank (3)

3.1.3 Area of the mild steel plate used to shape the tank into its cylindrical shape. (2)

3.2 During the rolling process of the metal to form the shape of the tank, TWO metal properties supported the rolling process.

3.2.1 State TWO properties of metal. (2)

3.2.2 State the device that was used to check for the correctness of the inside diameter of the mild steel tank. (1)

3.2.3 Differentiate between the two metal properties stated in QUESTION 3.2.1. (4)

[15]

QUESTION 4

4.1 Boilermakers use four types of bending and forming machines in the fabrication workshop, namely a press forming, bar folder, cornice brake and a rolling machine.

Arrange the machines according to:

4.1.1 Bending machines

4.1.2 Forming machines

(2 × 2) (4)

4.2 In the fabrication workshop, boilermakers roll flat metal sheets and plates into cylinders or curved segments using rolling machines.

Make a neat, labelled sketch to show how a plate is rolled in a rolling machine. (7)

4.3 Define the term *hardness.* (1)

[12]

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QUESTION 5

5.1 In the boilermaking workshop, boilermakers highly rely on the use of the oxyacetylene cutting process for the cutting and bevelling of thick materials.

State TWO distinct functions of a regulator. (2)

5.2 Copy and complete the TABLE below in the ANSWER BOOK to differentiate between the *acetylene regulator* and *oxygen regulator*.

ITEM	ACETYLENE REGULATOR	OXYGEN REGULATOR
Colour	5.2.1	5.2.2
Thread direction	5.2.3	5.2.4

(4)

5.3 During the assembly of oxyacetylene equipment, a flashback arrestor is also included in the assembling process.

State a distinct function of an arrestor. (2)

5.4 During the oxyacetylene flame setting, the three types of flames that are achieved are the carburising flame, oxidising flame and neutral flame.

Draw THREE neat, labelled sketches to show these different types of flames.

(3 × 2) (6)

[14]

QUESTION 6

6.1 Material ends up with sharp edges during the dry-cutting or wet-cutting processes.

6.1.1 Name THREE types of tools or equipment that can be used to remove these sharp edges. (3)

6.1.2 Differentiate between *dry cutting* and *wet cutting*. (2)

6.2 Show by means of a neat sketch how each of the following steel profiles is wrongly held in the vice during the sawing process.

6.2.1 Pipe

6.2.2 Angle iron

6.2.3 T-bar

(3 × 3) (9)

[14]

TOTAL: 75

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