higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

NATIONAL CERTIFICATE (VOCATIONAL)

ENGINEERING FABRICATION
(First paper)
NQF LEVEL 2

(6031002)

1 December 2020 (Y-paper)
13:00–15:00

This question paper consists of 5 pages.

145Q1N2001

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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. 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

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

1.1 Using a template as a guide for drilling into steel section is the only distinctive reason for using templates.

1.2 A bar folder is used to bend different types of pipes into round shape.

1.3 The box-and-pan brake is similar to a press brake.

1.4 The bar folder is a typical example of the forming machines.

1.5 Deburring tool is used to grind away sharp edges on cut materials.

1.6 Wet cutting is one of the TWO classes of sawing practice.

(6 × 1) **[6]**

QUESTION 2

Choose a description from COLUMN B that matches a description in COLUMN A. Write only the letter (A–F) next to the question number (2.1–2.4) in the ANSWER BOOK.

COLUMN A		COLUMN B	
2.1	The life of the blade is extended.	A	one of the inspection rules of a power saw
2.2	Getting helped when cutting heavy materials …	B	cut materials by operating power saw machine
2.3	Never lift the saw frame by hand, it lifts automatically	C	remove cut material from the vice carefully
2.4	After cutting materials, …	D	one of the rules for power sawing
		E	one of the safety precautions when cutting
		F	one of the advantages of using a coolant

(4 × 1) **[4]**

SECTION B

QUESTION 3

3.1 In the fabrication workshop, boilermakers strongly rely upon the use of templates to keep to required measurements and tolerances.

3.1.1 Differentiate between *tolerance* and *allowance*. (3)

3.1.2 List THREE advantages of using templates. (3)

3.2 Show by means of a neat labelled sketch each of the following

3.2.1 The checking of the correctness of the outside diameter of the rolled pipe. (4)

3.2.2 The marking-off of holes on the outside of the channel. (4)
[14]

QUESTION 4

4.1 During the bending or the rolling process of metals, metal properties play an important role. Explain each of the following metal properties.

4.1.1 Hardness (2)

4.1.2 Malleability (2)

4.1.3 Brittleness (1)

4.2 Differentiate between *ductility* and *hardness*. (3)

4.3 A tank made of mild steel that is 18 mm thick has a circumference of 2 147 mm.

Calculate the external diameter of the tank in millimetres. (7)
[15]

QUESTION 5

5.1 Rolling machines and bending machines are mostly used by boilermaker to achieve different shapes of items in the fabrication process.

Differentiate between *rolling* and *bending*. (4)

5.2 Show by means of a neat labelled sketch how rollers are arranged in a rolling machine to roll flat plates and flat metal strips. (6)

5.3 State TWO metal properties that governs the rolling of the plates in the rollers. (2)
[12]

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QUESTION 6

6.1 Oxy-acetylene cutting process helps boilermakers to cut thicker materials in the fabrication workshop.

List THREE types of flames that are achieved during the oxy-acetylene flame setting process. (3)

6.2 State TWO causes of backfiring. (2)

6.3 Show by means of a neat labelled sketch each of the following:

6.3.1 Carburizing flame (2)

6.3.2 Irregular cutting (2)

6.3.3 Cutting speed too slow (3)

[12]

QUESTION 7

7.1 Show by means of a neat labelled sketch how each of the following steel sections are correctly held in a vice during the sawing process.

7.1.1 Angle iron

7.1.2 T-bar

7.1.3 Flat bar

(3 × 2) (6)

7.2 State TWO types of abrasive cutting. (2)

7.3 Name FOUR factors to be considered when selecting a blade for cutting. (4)

[12]

TOTAL: 75

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