higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

NATIONAL CERTIFICATE (VOCATIONAL)

ENGINEERING FABRICATION
(First Paper)
NQF LEVEL 2

(6031002)

22 November 2018
09:00–11:00

Drawing instruments and calculators may be used.

This question paper consists of 6 pages

NCOT

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. Cross out ALL work you do NOT want to be marked.
5. Write neatly and legibly.

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QUESTION 1

1.1 Boiler makers use templates to develop patterns and mark off structural steel sections.

1.1.1 State THREE advantages of using a template. (3)

1.1.2 Name TWO development methods that can be used to make templates. (2)

1.2 Choose a description from COLUMN B that matches a term in COLUMN A. Write only the letter (A–E) next the question number (1.2.1–1.2.3) in the ANSWER BOOK.

COLUMN A		COLUMN B	
1.2.1	Scale up or enlargement scale	A	check correctness of outside diameter
1.2.2	External templates	B	example of materials used for template making
1.2.3	Wood or hard board	C	check correctness of inside radius
		D	makes the object bigger than original size
		E	allows object to be drawn to actual size

(3 × 1) (3)

1.3 Show by means of TWO neat, separate drawings how the scales below are used in a real-life situation. Start by drawing it to full scale.

1.3.1 Reduction scale (3½)

1.3.2 Enlargement scale (3½)
[15]

QUESTION 2

2.1 State the function of each of the hand tools used by boiler makers during the marking-off and laying-out process.

2.1.1 Bevel gauge (1)

2.1.2 Trammels (2)

2.1.3 Chalk line (2)

2.2 Compare the following tools by completing the table below. Write only the answer next to the question number (2.2.1–2.2.4) in the ANSWER BOOK.

	Centre punch	**Prick punch**
Included angle	2.2.1	2.2.2
Tool function	2.2.3	2.2.4

(4 × 1) (4)

2.3 Calculate the length of a 12 mm thick plate required to make a cylinder with an inside diameter of 944 mm. (6)

[15]

QUESTION 3

3.1 Explain each of the following material properties which play an important role the forming and shaping process:

3.1.1 Hardness

3.1.2 Malleability

3.1.3 Ductility

(3 × 1) (3)

3.2 Compare *ductility* and *malleability.* (2 + 2) (4)

3.3 Indicate whether the following statements are TRUE or FALSE. Choose the answer and write only 'True' or 'False' next to the question number (3.3) in the ANSWER BOOK.

A bar folder is a bending machine to bend sheet metal or to form edges. (2)

3.4 Calculate the area of a 20 mm thick plate required to make a cylinder with a height of 850 mm and an outside diameter of 280 mm. (6)

[15]

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QUESTION 4

4.1 The oxy-acetylene cutting process is mostly used by boiler makers to cut thick materials.

State THREE types of flames that are involved during the flame setting process. (3)

4.2 Complete the sentence by writing the missing word next to the question number (4.2) in the ANSWER BOOK.

… is caused by an in balanced setting of gases. (1)

4.3 State TWO main functions of a gas regulator. (2)

4.4 Show the following defects by making a neat sketch of each:

4.4.1 Rounded top corners

4.4.2 Irregular cutting

(2 × 2) (4)

4.5 Make a neat sketch of a neutral flame. (2)

4.6 Indicate whether the following statements are TRUE or FALSE. Choose the answer and write only 'True' or 'False' next to the question number (4.6.1–4.6.3) in the ANSWER BOOK.

4.6.1 A neutral flame has unequal quantities of oxygen and acetylene.

4.6.2 Unequal quantities of oxygen and acetylene result from backfiring.

4.6.3 Backfiring is mainly caused by cutting cool metals.

(3 × 1) (3)

[15]

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QUESTION 5

5.1 Study the following statements and arrange them according to the TWO groups in QUESTIONS 5.1.1 and 5.1.2. Write only the relevant letters (A–G) next to the question number (5.1.1–5.1.2) in the ANSWERBOOK.

A Speed of cut
B Reduced the power consumption
C Type of finish
D Accuracy
E Swarf is carried away from the work area
F Blade life
G Extended blade life

5.1.1 Requirements for blade selection (4)

5.1.2 Advantages of using coolant (3)

5.2 Show by means of a neat sketch how a power saw is used to cut materials. (7)

HINT: A power saw uses a reciprocating action.

5.3 Indicate whether the following statements are TRUE or FALSE. Choose the answer and write only 'True' or 'False' next to the question number (5.3) in the ANSWER BOOK.

The reciprocating type is one of three principal types of metal-cutting power saws. (1)

[15]

TOTAL: 75

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