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 2019 (Y-Paper)
13:00–15:00

REQUIREMENTS: **ONE A2 drawing sheet**

Candidates will require drawing instruments.

This question paper consists of 5 pages.

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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. Write neatly and legibly.

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QUESTION 1

1.1 Templates are devices that are made up of reliable flat sheet of material to be used in the repetitive copying of profiles required for the fabrication of sheet-metal products or components.

Illustrate by means of a neat sketch how a template is used to mark off back marks on the leg on an angle iron. (4)

1.2 List FOUR types of materials that can be used for making templates. (4)

1.3 State the developmental method used for templating in QUESTION1.1. (1)

1.4 Differentiate between the *back-mark* and the *back-mark gauge* as involved in the marking of angle iron. (3)

1.5 Show by means of a neat sketch how a template is used to mark holes on the web of an I-beam. (3)

[15]

QUESTION 2

2.1 During the marking-off process, boilermakers rely heavily on tools.

Differentiate between the *back-mark gauge* and *bevel gauge* in terms of their functions. (3)

2.2 Mothabo company fabricated a 16 mm steel tank with an inside diameter of 1 200 mm, a height of 1 800 mm and a closed base.

2.2.1 Calculate the volume of the tank in meter cubed. (4)

2.2.2 Calculate the area of the plate required to make the cylinder. (4)

2.2.3 Name TWO metal properties that helped in the rolling of the cylinder stated in QUESTION 2.2. (2)

2.3 Indicate whether the following statements are TRUE or FALSE. Choose the answer and write only 'True' or 'False' next to the question number (2.3.1–2.3 2) in the ANSWER BOOK.

2.3.1 The roundness of the cylinder is checked by using either an internal or external template.

2.3.2 During the rolling of the cylinder, the mean line contracts.

(2 × 1) (2)

[15]

QUESTION 3

3.1 Name any THREE machines used for forming and shaping. (3)

3.2 Differentiate between *bending machine* and *rolling* (forming). (4)

3.3 Illustrate by means of a neat sketch how each of the following settings differs from each other and explain the cause of the difference.

3.3.1 Over-presetting

3.3.2 Correct setting

(3 × 2) (6)

3.4 When you work with cutting machines and other tools in the workshop, you need to take care NOT to cause an accident or injure yourself or someone else.

LIST any TWO dangerous hazards. (2)
[15]

QUESTION 4

4.1 FIGURE 1 below shows ONE of the types of oxy-acetylene equipment that is used in the cutting process.

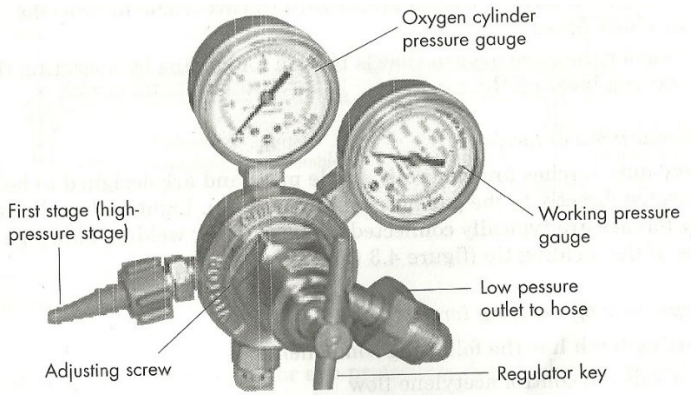

FIGURE 1

4.1.1 State the name of the equipment that is shown in FIGURE 1 above. (1)

4.1.2 State TWO functions of the equipment named in QUESTION 4.1.1. (2)

4.2 During the oxy-acetylene flame setting process, THREE types of flames are involved.

State the type of flame that is suitable for cutting. (1)

4.3 During the flame setting process, backfiring occurs.

4.3.1 Differentiate between backfiring and flash back. (3)

4.3.2 Illustrate by means of neat sketches how oxidising and neutral flames differ from each other. (4)

4.4 Illustrate by means of a neat sketch how the following surfaces will appear if:

4.4.1 The nozzle is held too high from the metal being cut.

4.4.2 The nozzle is held too close to the metal being cut.

(2 × 2) (4)
[15]

QUESTION 5

5.1 Many different types of lubricant oils are available and each is suitable for a particular purpose.

LIST any THREE purposes that lubricants serve. (3)

5.2 Illustrate by means of neat sketches how each of the following steel sections can be correctly and wrongly held in a vice.

5.2.1 T-bar

5.2.2 Round pipe

(4 × 2) (8)

5.3 Differentiate between *wet cutting* and *dry cutting*. (2 × 2) (4)
[15]

TOTAL: 75

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