higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

NATIONAL CERTIFICATE (VOCATIONAL)

ENGINEERING FABRICATION
(First Paper**)**
NQF LEVEL 2

(6031002)

12 March 2018 (X-Paper)
09:00–11:00

Calculators may be used.
Candidates need drawing instruments.

This question paper consists of 5 pages.

NCV

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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. All work you do NOT want to be marked, must be clearly CROSS OUT.
5. Write neatly and legibly.

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QUESTION 1

FIGURE 1 below shows a pipe clamp made of 75 mm × 12 mm thick flat bar.

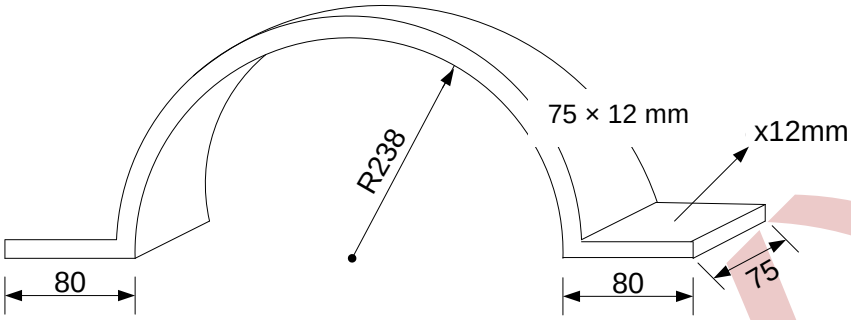

FIGURE 1

1.1 Calculate the length of a flat bar in millimetres if you are required to roll a cylinder using the radius 238 mm. (4)

1.2 Calculate the area of the flat bar calculated in QUESTION 1.1. Leave the answer in metres. (3)

1.3 State TWO metal properties that allowed a 75 mm × 12 mm thick flat bar to be bent and rolled during the fabrication of the pipe clamp. (2)

1.4 Name the device that was used to check the correctness of the 238 mm radius as indicated in the pipe clamp. (2)

1.5 Differentiate between the *contraction line* and the *expansion line* as they were involved in the rolling of the pipe clamp. (4)

[15]

QUESTION 2

2.1 Indicate whether the following statements are TRUE or FALSE. Choose the answer and write only 'true' or 'false' next to the question number (2.1.1–2.1.5) in the ANSWER BOOK.

2.1.1 Templates are used as guide plates for drilling into steel sections.

2.1.2 Tolerance allows workers to go beyond the given size(s) when required.

2.1.3 Templates must only provide adequate clearance for marking off in steel.

2.1.4 A map, drawing and sketches are used to illustrate scaling up.

2.1.5 Incorrect template production, highly saves material in the workshop.

(5 × 1) (5)

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2.2 Differentiate between a *tolerance* and an *allowance*. (4)

2.3 Illustrate, by means of TWO neat sketches, how an internal and external template can be used to check the correctness of a pipe. (2 x 3) (6)

[15]

QUESTION 3

3.1 During the assembling of oxyacetylene equipment, regulators are connected to the cylinders first.

3.1.1 Differentiate between an oxygen and an acetylene regulator with regard to their colour and the thread direction. (4)

3.1.2 Name TWO functions of regulators as they are connected to cylinders. (2)

3.2 Illustrate, by means of a neat sketch, each of the following types of flames:

3.2.1 Neutral flame

3.2.2 Oxidising flame

3.2.3 Carburising flame

(3 × 2) (6)

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 (3.3.1–3.3.3) in the ANSWER BOOK.

3.3.1 Oxygen is closed first to shut down the cutting torch during the cutting or the welding process.

3.3.2 Cylinders can be used as roller beds for moving articles.

3.3.3 The valve of an empty cylinder should always be kept open to prevent breathing.

(3 × 1) (3)

[15]

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QUESTION 4

4.1 Differentiate between *cutting* and *abrasion*. (3)

4.2 State SIX rules to be observed for good power sawing. (6)

4.3 Illustrate, by means of a neat sketch, the correct clamping method to be used on an angle iron for the correct power saving. (2)

4.4 Indicate whether the following statements are TRUE or FALSE. Choose the answer and write only 'true' or 'false' next to the question number (4.4.1–4.4.4) in the ANSWER BOOK.

4.4.1 Abrasive cutting can only be done by wet cutting.

4.4.2 Cutting and abrasion are the most important processes that are carried out on a guillotine.

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

4.4.4 When cutting small cross sections and thin walls, use a blade with 4 teeth per inch to avoid chip removal.

(4 × 1) (4)
[15]

QUESTION 5

5.1 Indicate whether the following statements are TRUE or FALSE. Choose the answer and write only 'true' or 'false' next to the question number (5.1.1–5.1.2) in the ANSWER BOOK.

5.1.1 A pipe bender machine is used to bend pipes and tubing without changing its cross-sectional area.

5.1.2 A press brake is used to bend pipes and tubing without changing its cross-sectional area.

(2 × 1) (2)

5.2 Name TWO machines that are used for bending metal sheets. (2)

5.3 Differentiate between *ductility* and *malleability* as they are important in the rolling and bending of metals. (3)

5.4 Illustrate, by means of TWO neat sketches, how the rolling of a sheet of metal is done. (8)
[15]

TOTAL: 75

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