higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

NATIONAL CERTIFICATE

PLATING AND STRUCTURAL STEEL DRAWING N4

(8090124)

11 August 2021 (X-paper)
09:00–13:00

REQUIREMENTS: ONE A2 drawing paper

Drawing instruments and nonprogrammable calculators may be used.

This question paper consists of 7 pages and 1 answer sheet.

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DEPARTMENT OF HIGHER EDUCATION AND TRAINING
REPUBLIC OF SOUTH AFRICA

NATIONAL CERTIFICATE
PLATING AND STRUCTURAL STEEL DRAWING N4
TIME: 4 HOURS
MARKS: 100

NOTE: If you answer more than the required number of questions, only the required number of questions will be marked. Clearly crossed out all work you do not want to be marked.

INSTRUCTIONS AND INFORMATION

1. Read all the questions carefully.
2. Answer any FOUR of the FIVE questions.
3. Use only ONE drawing sheet.
4. Answer TWO questions on the front and TWO questions on the reverse side of the drawing paper.
5. Number the answers according to the numbering system used in this question paper.
6. Show all the calculations on the question paper.
7. Insert all the dimensions, title and scale on each drawing.
8. Write neatly and legibly.

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QUESTION 1

FIGURE 1 below shows the front view and top view of a semi-circular ends-to-ellipse transformer. The transformer will be used in the ducting that blows hot air into an oven at a brick manufacturing company.

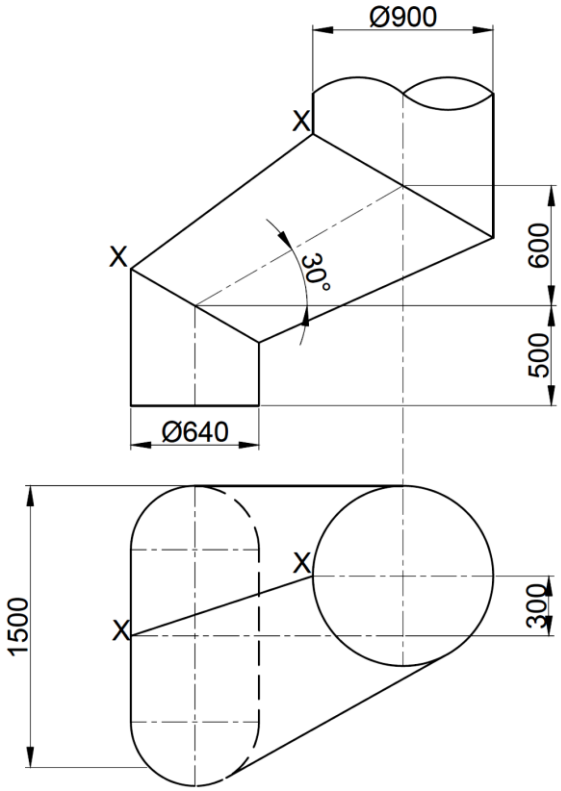


FIGURE 1

Draw the following to scale 1:20:

1.1 The given views.

1.2 The pattern of the transformer. The joint of the pattern is at X-X.

The completed drawing must clearly indicate all the construction lines. Print the following title and scale centrally below the finished drawing:

SEMI-CIRCULAR ENDS-TO-ELLIPSE TRANSFORMER
SCALE 1:20

[25]

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QUESTION 2

FIGURE 2 below shows the front view and left view of a simple elbow. The upper limb is at 60° in the front view and at 45° in the left view. The elbow is part of the piping that extract fumes from a boiler room on a ship.

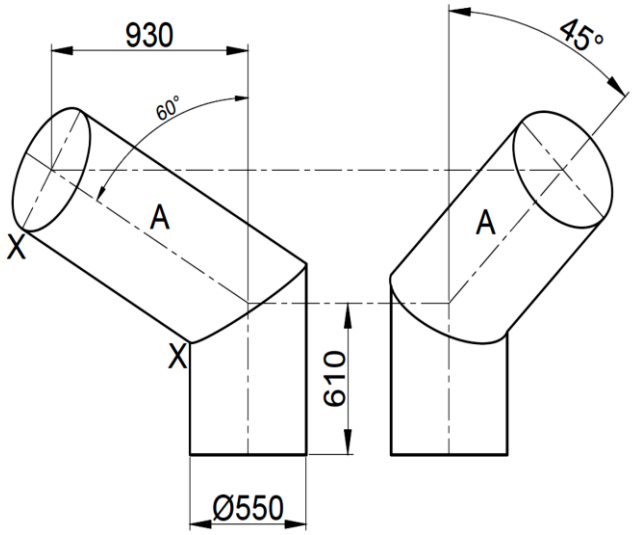


FIGURE 2

Draw the following to scale 1:20:

2.1 The given views without the ellipses.

2.2 The top view of the elbow without the ellipses.

2.3 An auxiliary projection of the elbow.

2.4 The ellipses in the top view, front view and left view.

2.5 The pattern of limb A of the elbow. The joint of the pattern is at X-X.

The completed drawing must clearly indicate all the construction lines. Print the following title and scale centrally below the finished drawing:

PIPE ELBOW AT COMPLEX ANGLES
SCALE 1:20

[25]

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QUESTION 3

FIGURE 3 below shows the front view and top view of a two-way breeches piece. The breeches piece will be part of the ducting in an air conditioning plant of a hospital.

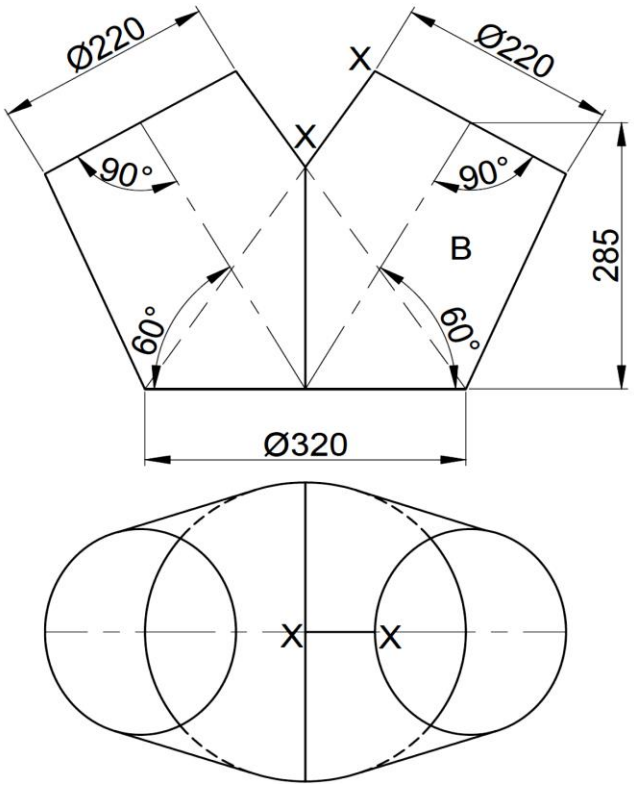


FIGURE 3

Draw the following to scale 1:5:

3.1 The given views of the two-way breeches piece.

3.2 The pattern of the plate to manufacture leg B of the two-way breeches piece. The joint of the pattern is at X-X.

The completed drawing must clearly indicate all the construction lines. Print the following title and scale centrally below the finished drawing:

TWO-WAY BREECHES PIECE
SCALE 1:5

[25]

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QUESTION 4

FIGURE 4 below shows the front view of an oblique cone connected to a right cone. The oblique cone connecting with the right cone will be used on a process tank in a fruit juice manufacturing company.

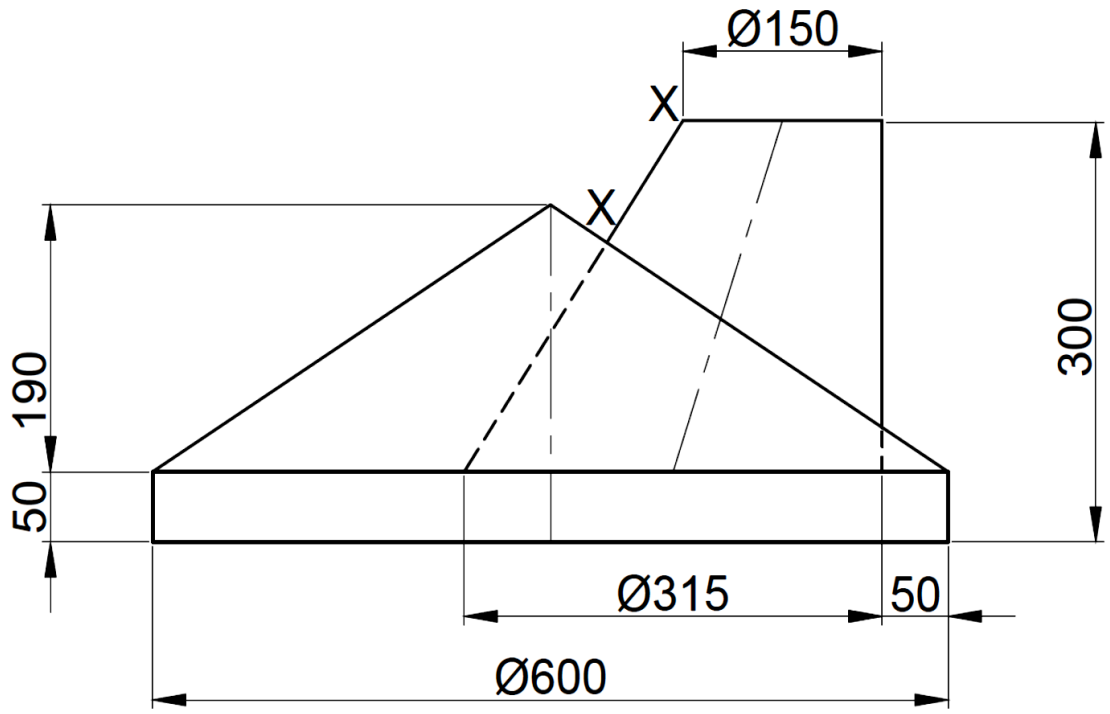


FIGURE 4

Draw the following to scale 1:5:

4.1 The given view without the interpenetration curve.

4.2 The half top view without the interpenetration curve.

4.3 The interpenetration curve in the front view and half top view.

4.4 The pattern of the oblique cone. The joint of the pattern is at X-X.

The completed drawing must clearly indicate all the construction lines. Print the following title and scale centrally below the finished drawing:

OBLIQUE CONE CONNECTED TO RIGHT CONE
SCALE 1:5

[25]

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QUESTION 5

FIGURE 5 below shows the front view and top view of a rectangle-to-square transition piece. The transition piece will be used as a fitting to guide material towards machines in a factory.

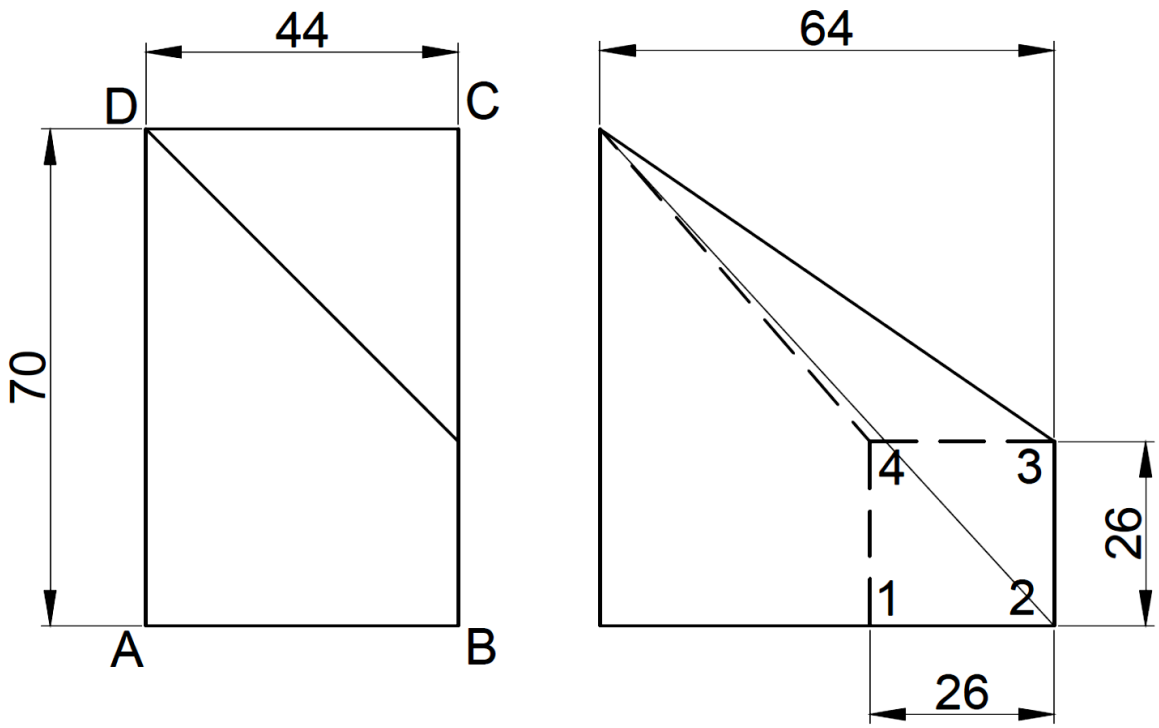


FIGURE 5

Do the following:

5.1 Draw the given views (not to scale).

5.2 Calculate the true lengths to develop the pattern of the transition piece.

Write the true lengths on the answer sheet (attached).

5.3 Use the calculated true lengths and develop the full pattern of the transition piece to scale 1:1.

The joint of the transition piece is shown at C4.

NOTE: Marks will NOT be awarded for lengths taken from the drawing to scale.

The completed drawing must clearly indicate all the construction lines. Print the following title and scale centrally below the finished drawing:

RECTANGLE-TO-SQUARE TRANSITION PIECE
SCALE 1:1

[25]

TOTAL: 100

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ANSWER SHEET: QUESTION 5

EXAMINATION NUMBER:

Hand in this table with the drawing paper.

Do all calculations on the drawing paper.

CALCULATE	**TRUE LENGTH**	**%**
AD = BC		1
A2		1
D2		2
D3		2
1-2; 2-3; 3-4; 4-1		1
A1		1
B1		1
AB = DC		1
C1		2
C3		1
C4		2
TOTAL		**15**

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