higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

NATIONAL CERTIFICATE

PLATING AND STRUCTURAL STEEL DRAWING N4

(8090124)

5 December 2023 (X-paper)
09:00–13:00

REQUIREMENTS: A2 drawing sheet

Drawing instruments and nonprogrammable calculators may be used.

This question paper consists of 5 pages, 1 answer sheet and 2 diagram sheets.

262Q1G2305

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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. All work you do not want to be marked must be clearly crossed out.

INSTRUCTIONS AND INFORMATION

1. Answer only FOUR questions.
2. Read all the questions carefully.
3. Number the answers according to the numbering system used in this question paper.
4. Show all the calculations.
5. Insert dimensions, a title and the scale on each drawing.
6. Draw on both sides of the drawing sheet.
7. Only ONE drawing sheet may be used.
8. Write neatly and legibly.

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QUESTION 1

FIGURE 1, DIAGRAM SHEET 1 (attached) shows the front view and top view of an off-centre rectangle-to-rectangle transition piece. The transition piece will be used as a guide on a machine in a leather goods factory.

Do the following:

1.1 Draw the given views (not to scale).

1.2 Calculate the true lengths to develop the full pattern of the transition piece. Write the true lengths on the ANSWER SHEET provided.

1.3 Use the calculated true lengths and develop to a scale of 1:1 the full pattern of the transition piece. The joint of the transition piece is shown at 4-6.

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

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

OFF-CENTRE RECTANGLE-TO-RECTANGLE
SCALE 1:1

[25]

QUESTION 2

FIGURE 2, DIAGRAM SHEET 1 (attached) shows two views of an off-centre connection of a main pipe and a branch pipe. The connection will be used to convey saw dust and bark chips to a storage tank at a sawmill.

Draw to a scale of 1:10 the following:

2.1 The front view and top view without the ellipses

2.2 The auxiliary view of the branch pipe without the line of intersection

2.3 The line of intersection in the auxiliary view

2.4 The ellipse in the top view and the front view

2.5 The line of intersection in the front view

2.6 The pattern of the branch pipe. The joint of the pattern is shown at X-X.

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

OFF-CENTRE CONNECTION
SCALE 1:10

[25]

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QUESTION 3

FIGURE 3, DIAGRAM SHEET 1 (attached) shows the front view and the top view of an oblique cone intersecting a right cone. The intersecting cones will be used as the top end of a beer tank at a brewery.

Draw to a scale of 1:10 the following:

3.1 The given views without the interpenetration lines

3.2 The interpenetration lines between the cones in both views

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

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

OBLIQUE CONE INTERSECTING RIGHT CONE
SCALE 1:10 **[25]**

QUESTION 4

FIGURE 4, DIAGRAM SHEET 2 (attached) shows three views of a flared ventilator head. The ventilator head will be used as part of the ducting in the ventilation system of an indoor sports facility.

Draw to a scale of 1:20 the following:

4.1 The given views

4.2 The pattern for the back panel

4.3 The pattern for the side panels

4.4 The pattern for the throat panel

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

FLARED VENTILATOR HEAD
SCALE 1:20 **[25]**

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QUESTION 5

FIGURE 5, DIAGRAM SHEET 2 (attached) shows two views of a two-way breeches piece. The breeches piece will be used as part of the ducting on the air-conditioning system of a mine.

NOTE: The joint X-X between the two limbs of the breeches piece will be in the shape of a semicircle.

Draw to a scale of 1:5 the following:

5.1 The TWO given views of the breeches piece

5.2 The pattern of limb on the right-hand side of the breeches piece. The joint of the pattern is shown at Y-Y.

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

TWO-WAY BREECHES PIECE
SCALE 1:5

[25]

TOTAL: 100

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ANSWER SHEET

EXAMINATION NUMBER: | | | | | | | | | | | | | |

This sheet must be handed in together with the drawing sheet.

The calculations must be done on the drawing sheet.

CALCULATE	**TRUE LENGTH**	**%**
AB		0,5
A1		1,5
B1		1,5
1-2		0,5
B2		1,5
2-3 and 1-5		0,5
B3		1,5
C3		1
BC and AD		0,5
3-4 and 4-5		1
4-6		0,5
3-6 and 5-6		1
C-6		0,5
A5		1,5
D5		1
D6		0,5
TOTAL		**15**

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DIAGRAM SHEET 1

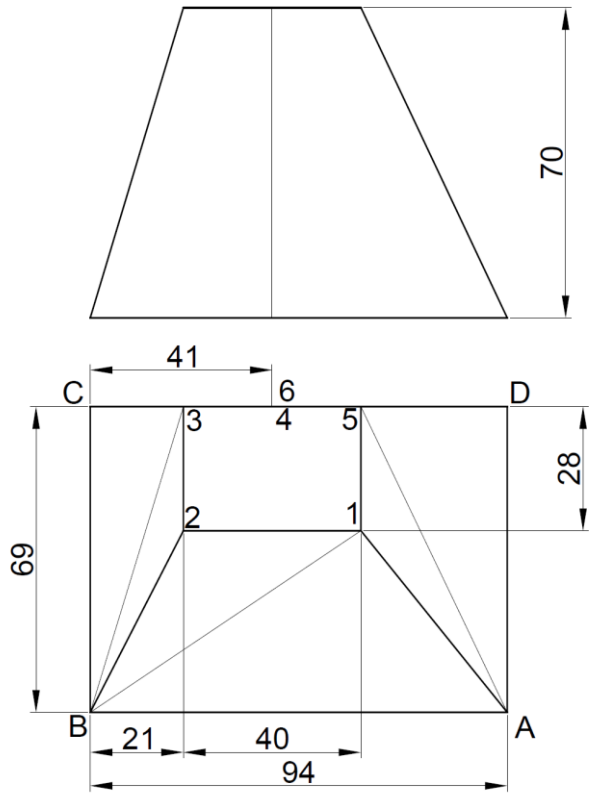


FIGURE 1

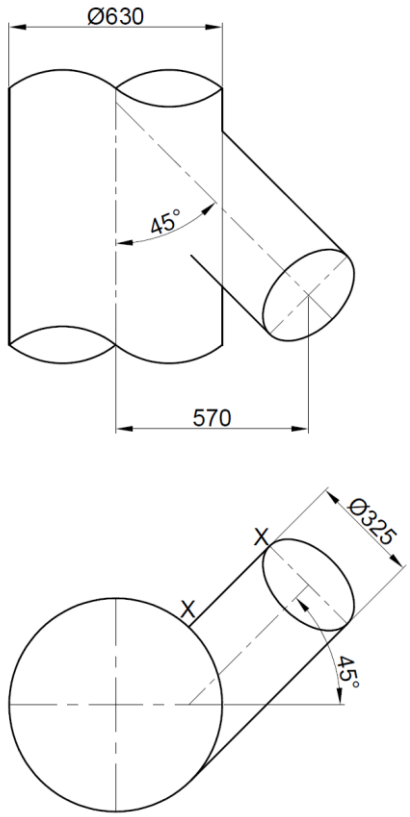


FIGURE 2

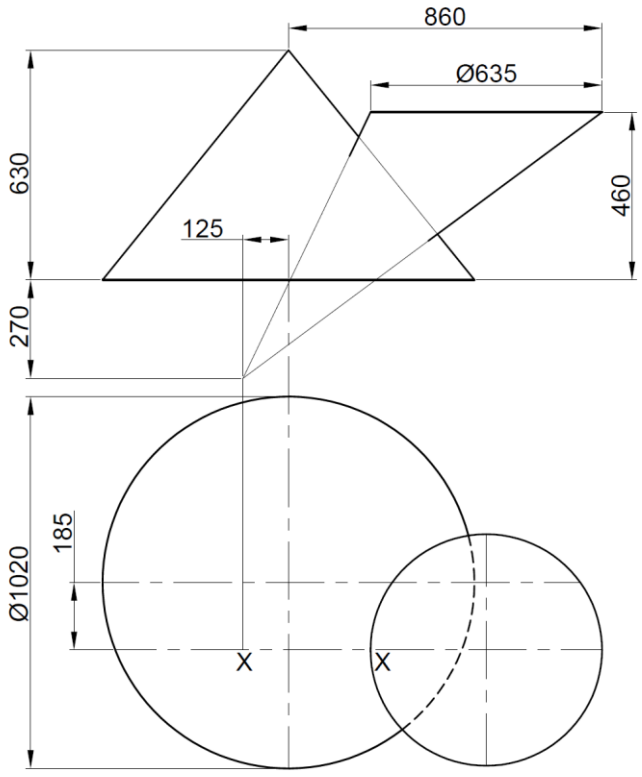


FIGURE 3

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DIAGRAM SHEET 2

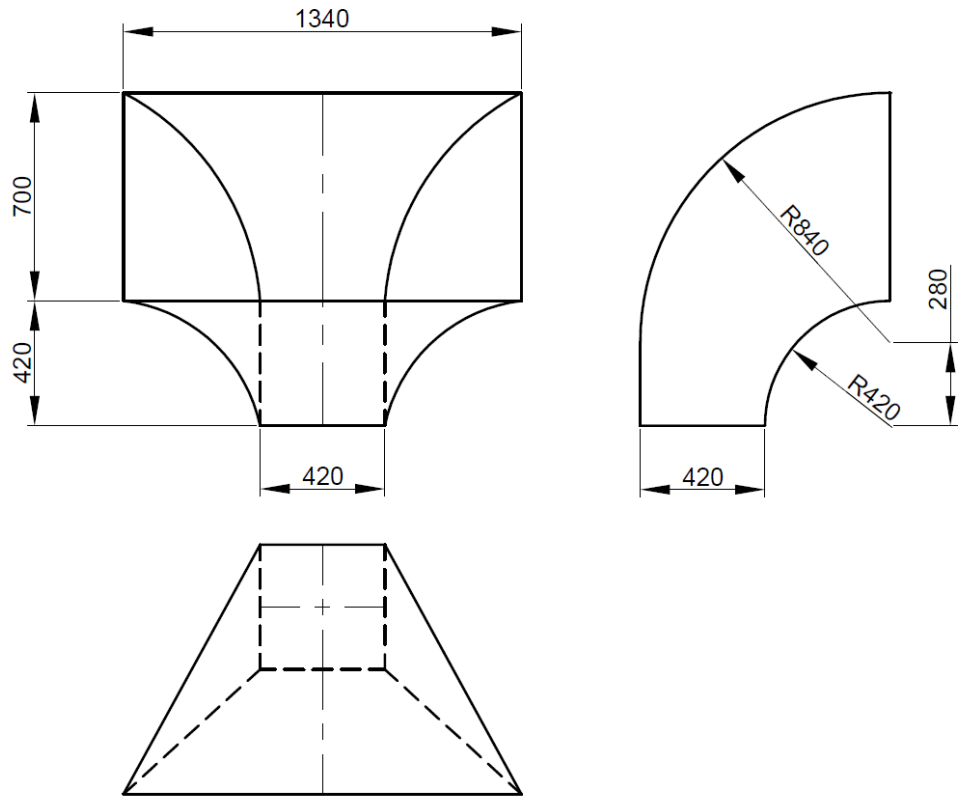


FIGURE 4

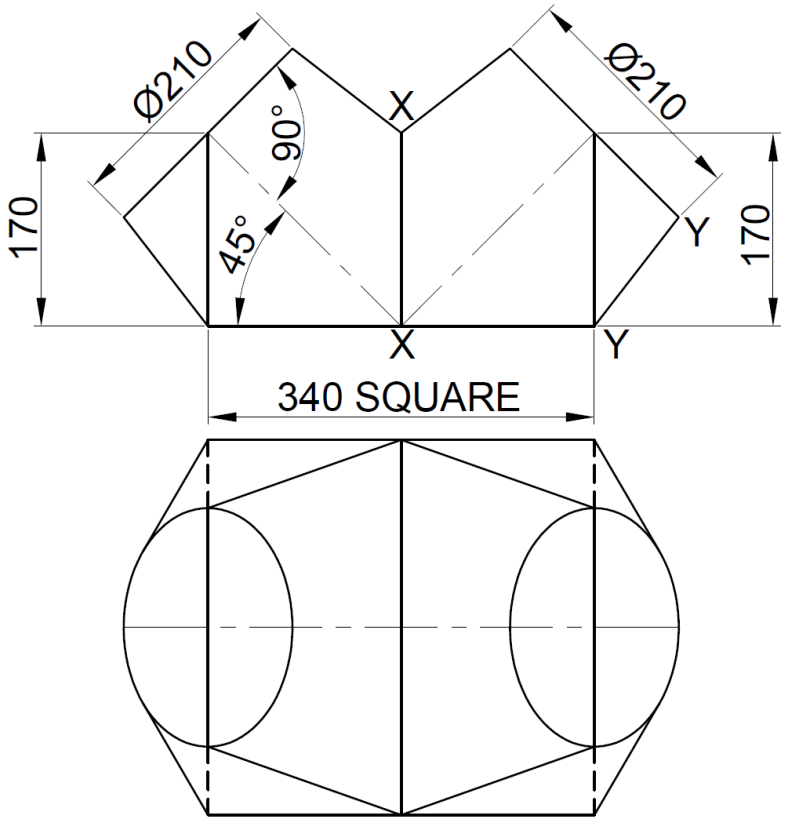


FIGURE 5

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