



# education

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Department:  
Education  
**REPUBLIC OF SOUTH AFRICA**

**T680(E)(M29)T**  
**APRIL 2010**

**NATIONAL CERTIFICATE**

**ENGINEERING DRAWING N2**

**(8090272)**

**29 March (X-Paper)**  
**09:00 – 13:00**

**This question paper consists of 4 pages and 6 annexures.**

**DEPARTMENT OF EDUCATION  
REPUBLIC OF SOUTH AFRICA  
NATIONAL CERTIFICATE  
ENGINEERING DRAWING N2  
TIME: 4 HOURS  
MARKS: 100**

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**INSTRUCTIONS AND INFORMATION**

1. Answer ALL the questions.
  2. Read ALL the questions carefully.
  3. Number the answers correctly according to the numbering system used in this question paper.
  4. Write neatly and legibly.
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**QUESTION 1: WELDING, COMPUTER-AIDED DRAUGHTING  
FASTENERS AND ELECTRICAL FITTINGS**

- 1.1 Name FIVE types of storage devices when using computer-aided draughting. (5)
- 1.2 Name the sketch of the stud in FIGURE 1, ANNEXURE A (attached). Write the answer next to the question number (1.2.1 - 1.2.5) in the ANSWER BOOK. (5)
- 1.3 Name the FOUR main parts of a welding symbol. (4)
- 1.4 Give the abbreviations of the following terms:
  - 1.4.1 Pitch circle diameter (1)
  - 1.4.2 Chamfer (1)
  - 1.4.3 Countersunk (1)
- 1.5 What is the main material that electrical fittings are made of? (1)

**[18]**

PTO

### QUESTION 2: SCREW THREADS

Draw, to scale 1:1, an M50 × 5 mm pitch, a single-start, external right-hand V-screw thread with a length of 80 mm to fit the bolt in FIGURE 2, ANNEXURE B (attached). The screw thread and bolt must be in a horizontal position.

[12]

### QUESTION 3: FIRST-ANGLE ORTHOGRAPHIC PROJECTION

FIGURE 3, ANNEXURE C (attached) shows two views of a pipe clamp in first-angle orthographic projection.

The front elevation is a half selection view with the right half in section. The left view is an outside view. The M20 nuts have been omitted.

Draw, to scale 1:2 (half scale) and in first-angle orthographic projection, the following views with M20 nuts in position:

- |     |  |      |
|-----|--|------|
| 3.1 | A full sectional front view on cutting plane N-N   | (7)  |
| 3.2 | A full sectional left view on cutting plane M-M  | (7)  |
| 3.3 | Insert SIX dimensions  | (3)  |
| 3.4 | Draw the first-angle orthographic projection symbol in a space below the title and scale | (1)  |
| 3.5 | Draw the following title and scale centrally beneath the layout:                         |      |
|     | Pipe clamp   |      |
|     | Scale 1:2  | (2)  |
|     |  | [20] |

### QUESTION 4: ISOMETRIC

FIGURE 4, ANNEXURE D (attached) shows two views of a work piece in first-angle orthographic projection.

Do NOT draw the given views but draw to scale 1:1 an isometric view of the work piece.

Point B must be the lowest point.

No hidden detail is required.

[15]

### QUESTION 5: INTERPENETRATION

FIGURE 5, ANNEXURE E (attached) shows in first-angle orthographic projection an incomplete front view and top view of a T-end.

- |     |  |             |
|-----|--|-------------|
| 5.1 | Draw the TWO given views to full scale (1:1).                      | (2)         |
| 5.2 | Complete the front view by plotting the curve of interpenetration. | (6)         |
| 5.3 | ALL projection and construction lines are to be shown.             | (2)         |
|     |  | <b>[10]</b> |

### QUESTION 6: THIRD-ANGLE ORTHOGRAPHIC PROJECTION AND MACHINE SYMBOLS

FIGURE 6, ANNEXURE F (attached) shows an outside front elevation and an outside right view of a model.

Draw, to scale 1:1 (full scale), the following views of the model:

- |     |   |             |
|-----|---|-------------|
| 6.1 | A full sectional front view on cutting plane Y-Y                                    | (6)         |
| 6.2 | A full sectional top view on cutting plane Z-Z                                      | (8)         |
| 6.3 | An outside right view   | (5)         |
| 6.4 | Add any SIX dimensions  | (3)         |
| 6.5 | Add the title and scale centrally beneath the layout                                | (2)         |
| 6.6 | Insert the third-angle orthographic projection symbol in a space beneath the layout | (1)         |
|     |   | <b>[25]</b> |

**TOTAL: 100**

ANNEXURE A

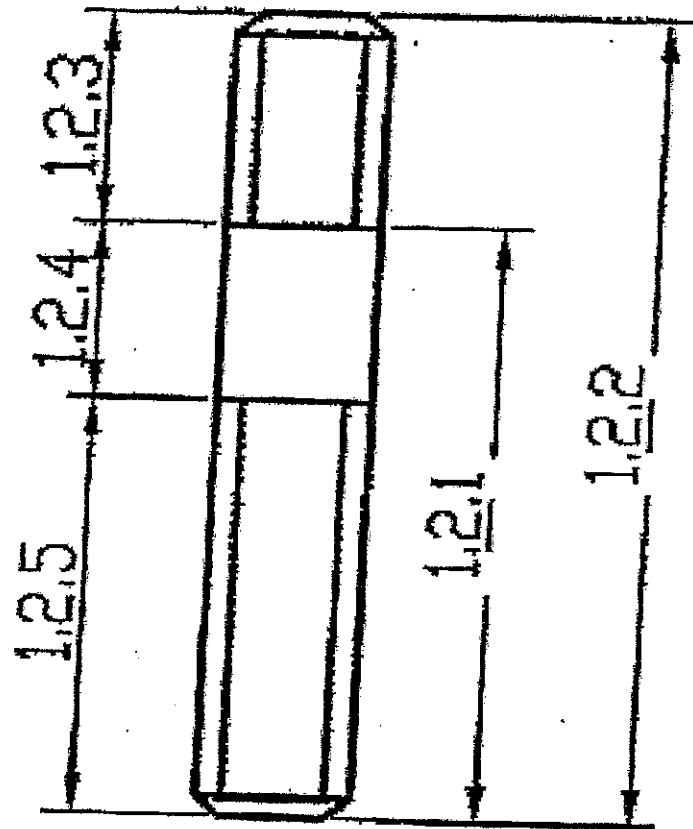


FIGURE 1

ANNEXURE B

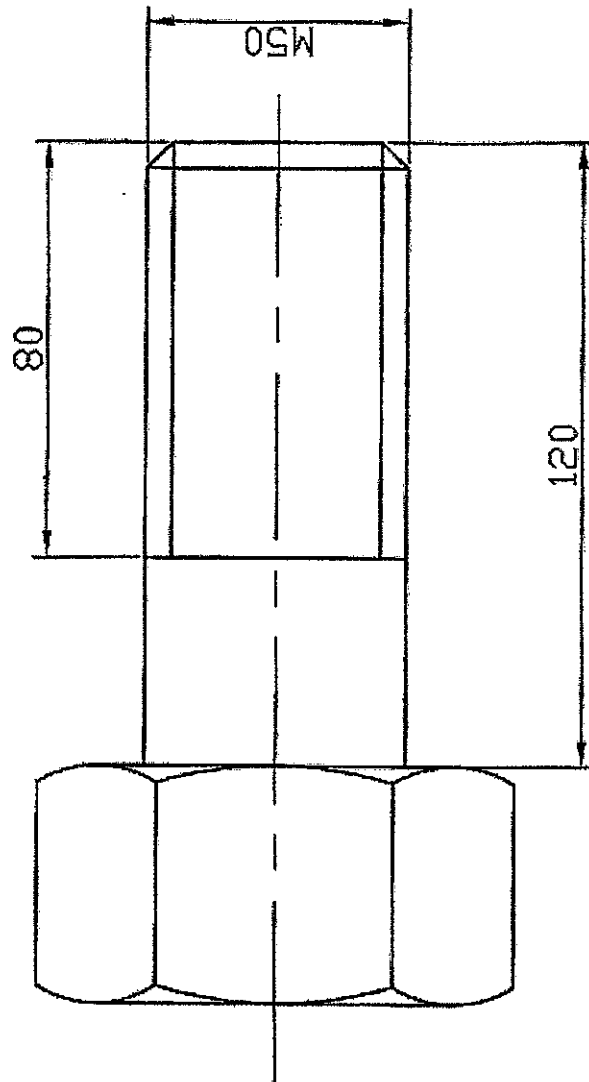
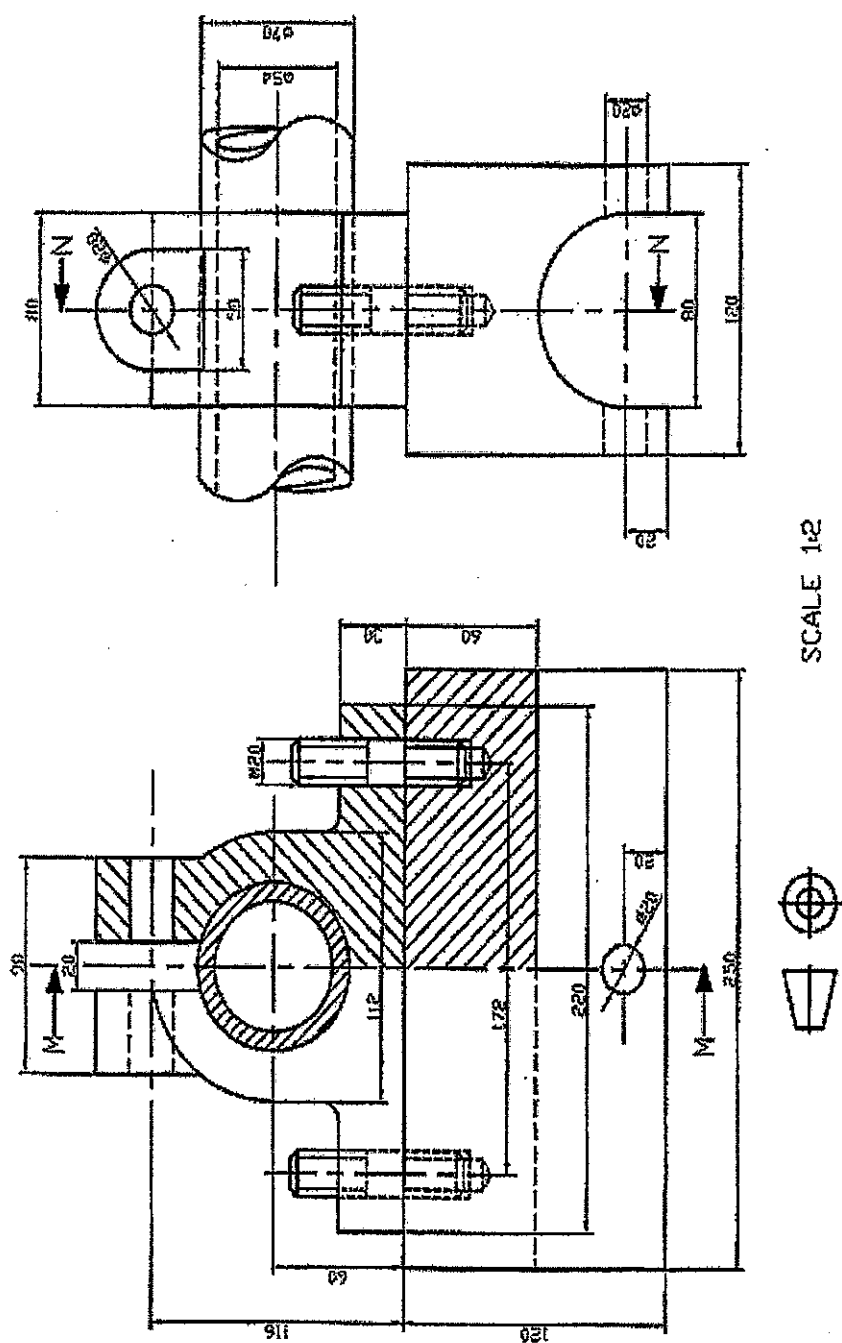


FIGURE 2

## ANNEXURE C



**FIGURE 3**

## ANNEXURE D

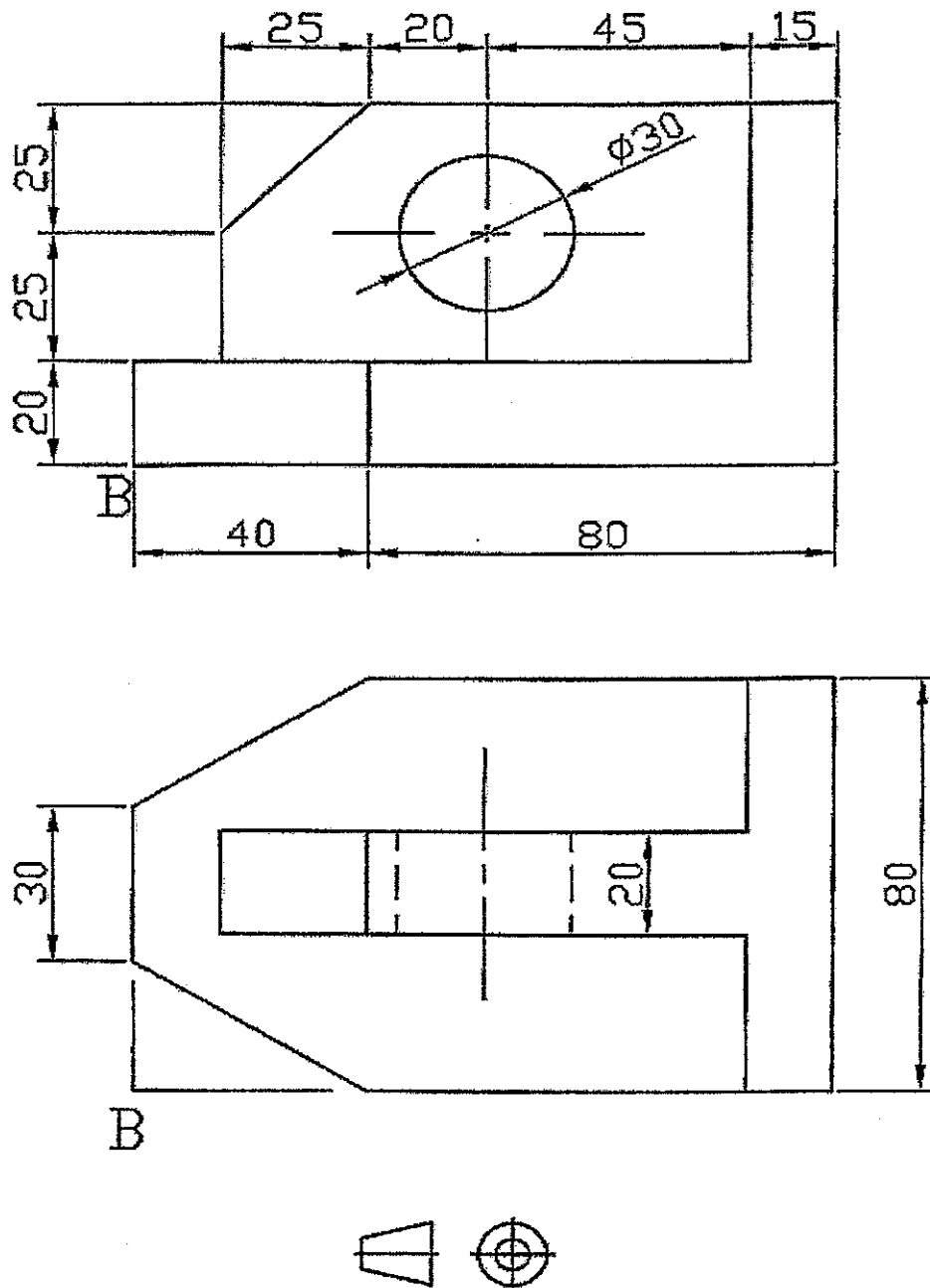


FIGURE 4



## ANNEXURE E

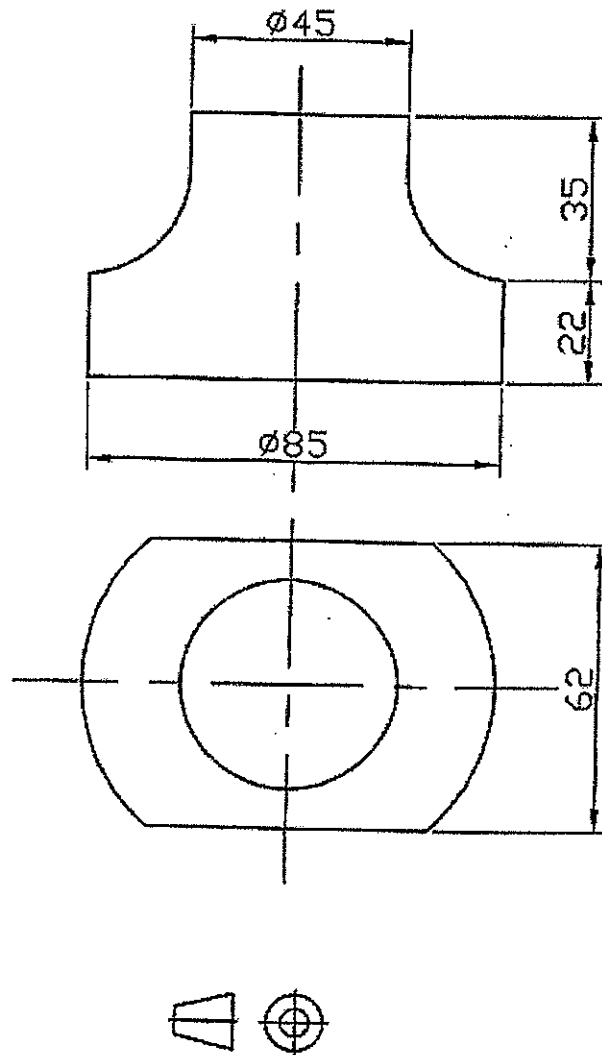


FIGURE 5

## ANNEXURE F

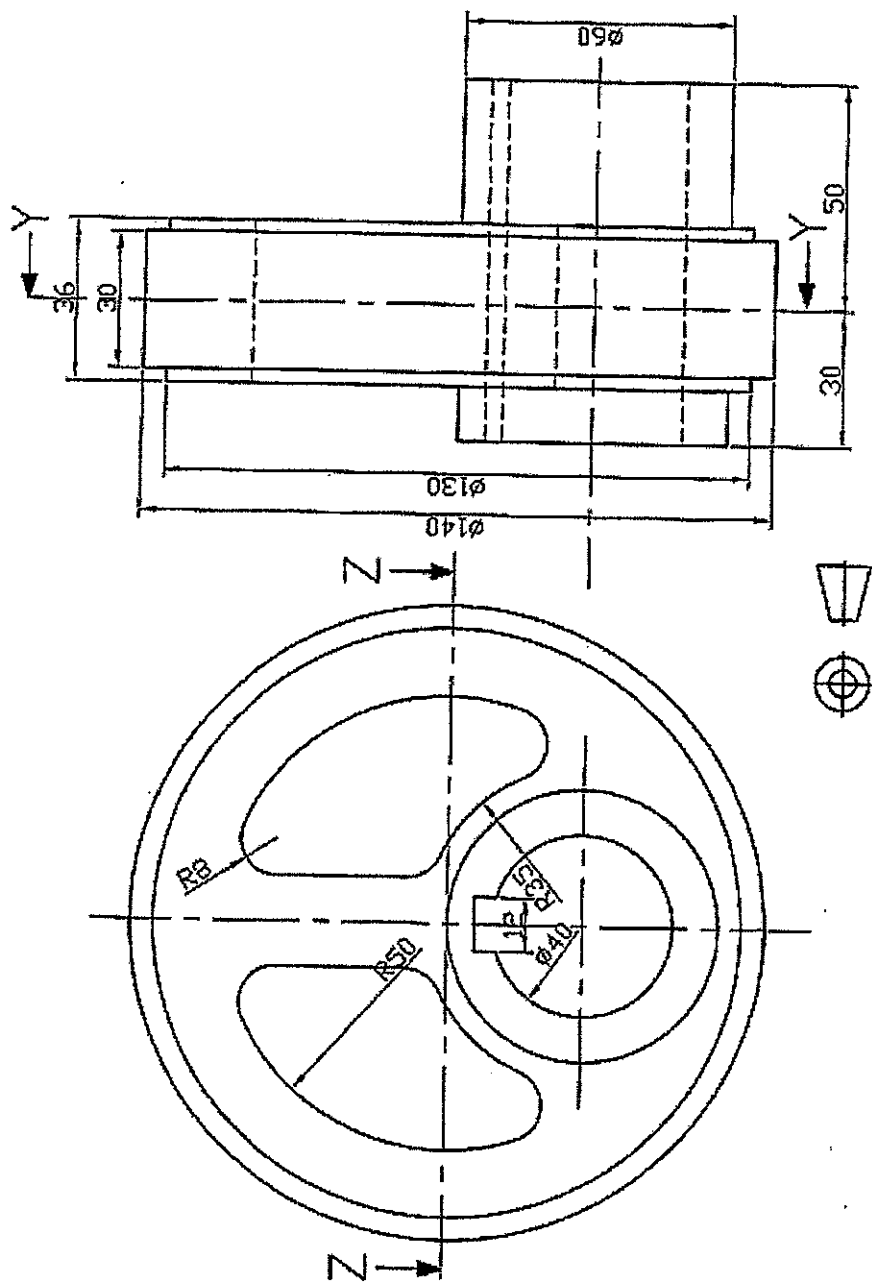


FIGURE 6