



# higher education & training

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Department:  
Higher Education and Training  
**REPUBLIC OF SOUTH AFRICA**

**T590(E)(J25)T**

**NATIONAL CERTIFICATE**

**ENGINEERING DRAWING N3**

**(8090283)**

**25 July 2019 (X-Paper)**  
**09:00–13:00**

**REQUIREMENTS: ONE A2 drawing sheet**

**This question paper consists of 10 pages and 1 answer sheet.**

**DEPARTMENT OF HIGHER EDUCATION AND TRAINING**  
**REPUBLIC OF SOUTH AFRICA**  
NATIONAL CERTIFICATE  
ENGINEERING DRAWING N3  
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 according to the numbering system used in this question paper.
  4. Use both sides of the DRAWING SHEET.
  5. Draw a 15 mm border on both sides of the DRAWING SHEET.
  6. Only the candidate information on the drawing sheet must be done in ink. ALL other drawing work must be done in pencil.
  7. Use a radius curve stencil to draw smaller arcs.
  8. Unspecified radii must be R3.
  9. A balanced layout is very important and candidates will be penalised for poor planning.
  10. ALL drawing work must conform to the latest SANS 10111 Code of Practice for Engineering Drawing.
  11. Work neatly.
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**MARK ALLOCATION**

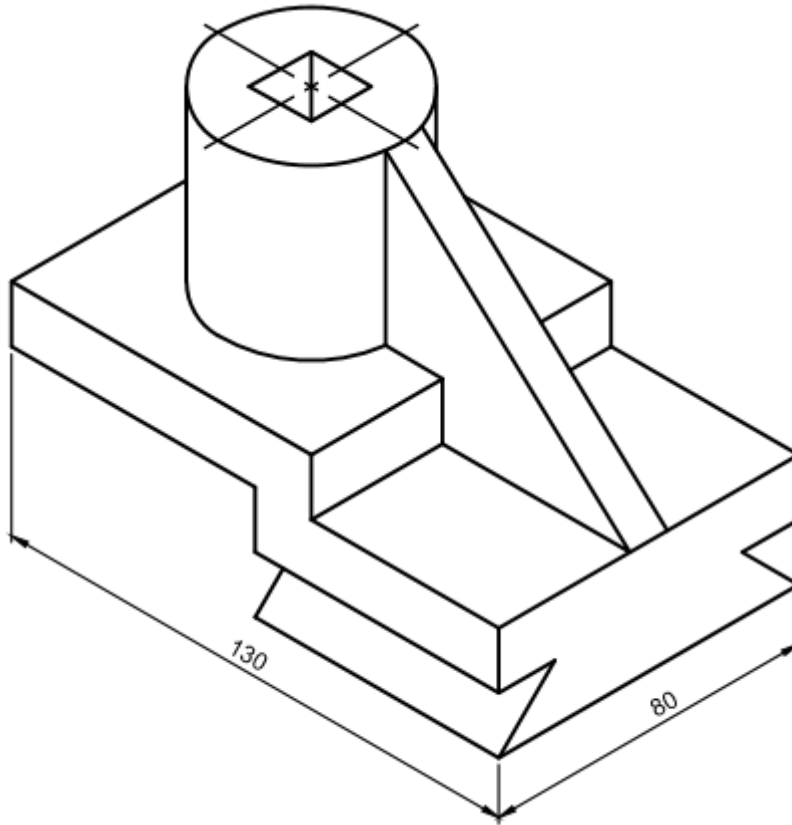
|  |  |             |
|--|--|-------------|
| <b>QUESTION 1: FREEHAND DRAWING</b>    |  | <b>[10]</b> |
|  | Correctness                                      | 4           |
|  | Line work  | 3           |
|  | Accuracy and proportion                          | 3           |
| <b>QUESTION 2: SECTIONAL DRAWING</b>   |  | <b>[25]</b> |
| 2.1                                    | Correctness – Full-sectional front view          | 5           |
| 2.2                                    | Correctness – Full-sectional right view          | 6           |
| 2.3                                    | Correctness – Top view                           | 6           |
|  | Line work  | 3           |
|  | Accuracy   | 3           |
| Layout and neatness                    |  | 2           |
| <b>QUESTION 3: ASSEMBLY DRAWING</b>    |  | <b>[30]</b> |
|  | Correctness                                      | 18          |
|  | Line work  | 5           |
|  | Accuracy   | 5           |
| Layout and neatness                    |  | 2           |
| <b>QUESTION 4: DETAIL DRAWING</b>      |  | <b>[20]</b> |
| 4.1                                    | Correctness – Full-sectional front view (Item 1) | 4           |
| 4.2                                    | Correctness – Top view (Item 1)                  | 4           |
| 4.3                                    | Correctness – Full-sectional front view (Item 2) | 4           |
|  | Line work  | 3           |
|  | Accuracy   | 3           |
| Layout and neatness                    |  | 2           |
| <b>QUESTION 5: PERSPECTIVE DRAWING</b> |  | <b>[15]</b> |
|  | Correctness                                      | 6           |
|  | Line work  | 3           |
|  | Accuracy   | 3           |
|  | SP + RVP + LVP                                   | 3           |
| <b>TOTAL:</b>                          |  | <b>100</b>  |

**QUESTION 1: FREEHAND DRAWING**

FIGURE 1 shows an isometric view of a component.



Make a freehand drawing of the given view approximately full size.



**FIGURE 1**

**[10]**

## QUESTION 2: SECTIONAL DRAWING

FIGURE 2 shows two primary views of a component.

Draw, to scale 1:1, the following views of the component in third-angle orthographic projection:

2.1 A full-sectional front view (5)

2.2 A full-sectional right view on cutting plane X-X (6)

2.3 A top view (6)

Line work, accuracy, layout and neatness (8)

Show hidden detail on view NOT in section.

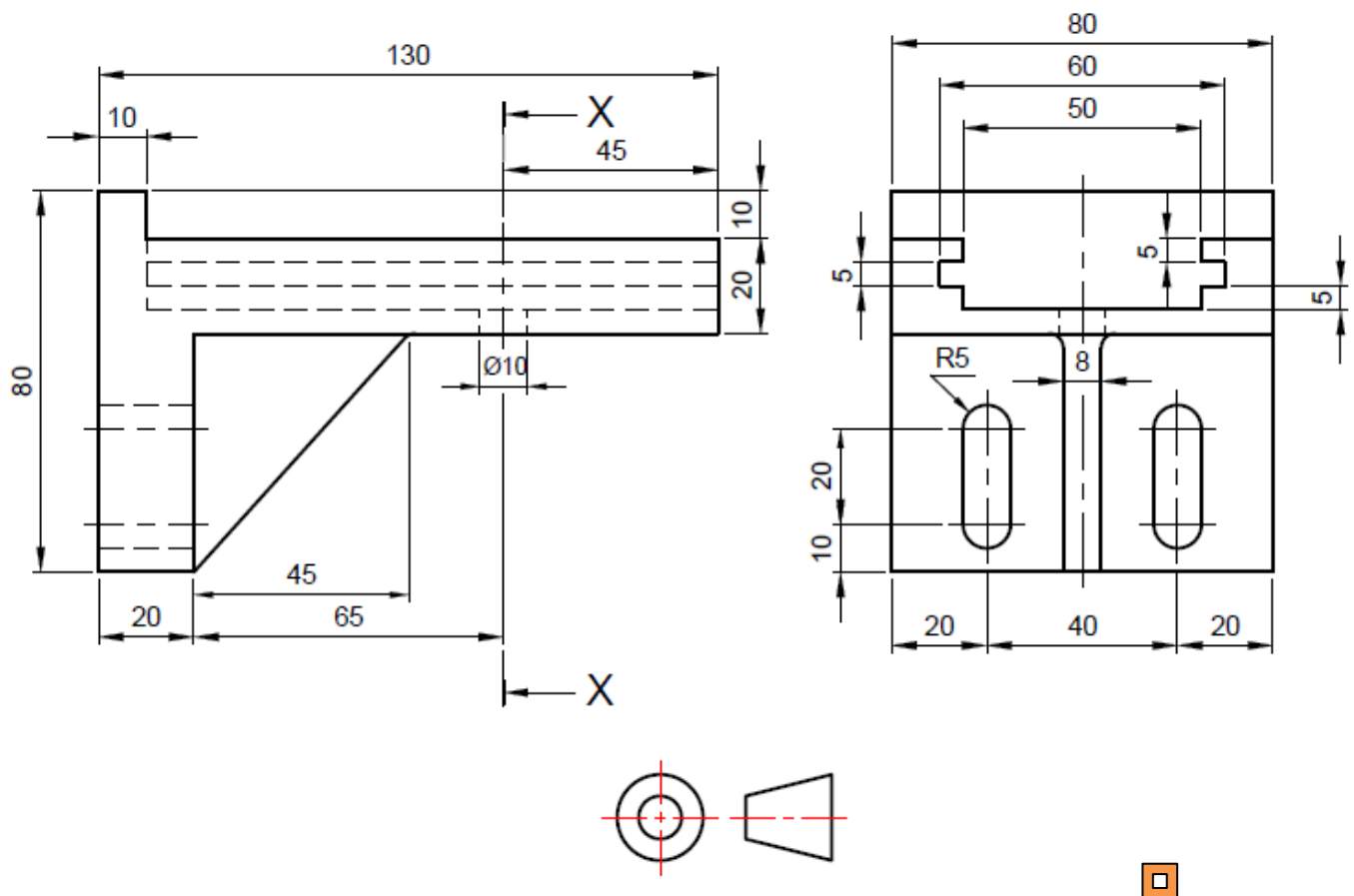



FIGURE 2

[25]

**QUESTION 3: ASSEMBLY DRAWING**

FIGURE 3 shows the primary views of the components of an adjustable roller-jack assembly.

The complete list of parts is as follows:

| ITEM | DESCRIPTION   | QUANTITY |
|------|---|----------|
| 1    | Base  | 1        |
| 2    | Roller cradle   | 1        |
| 3    | Roller  | 1        |
| 4    | Adjustment wrench  | 1        |
| 5    | Threaded rod  | 1        |
| 6    | Pin   | 1        |

Draw, to scale 1:1, an assembly drawing of a full-sectional front view of the adjustable roller-jack assembly, with the centre of the roller 180 mm above the bottom of the base.

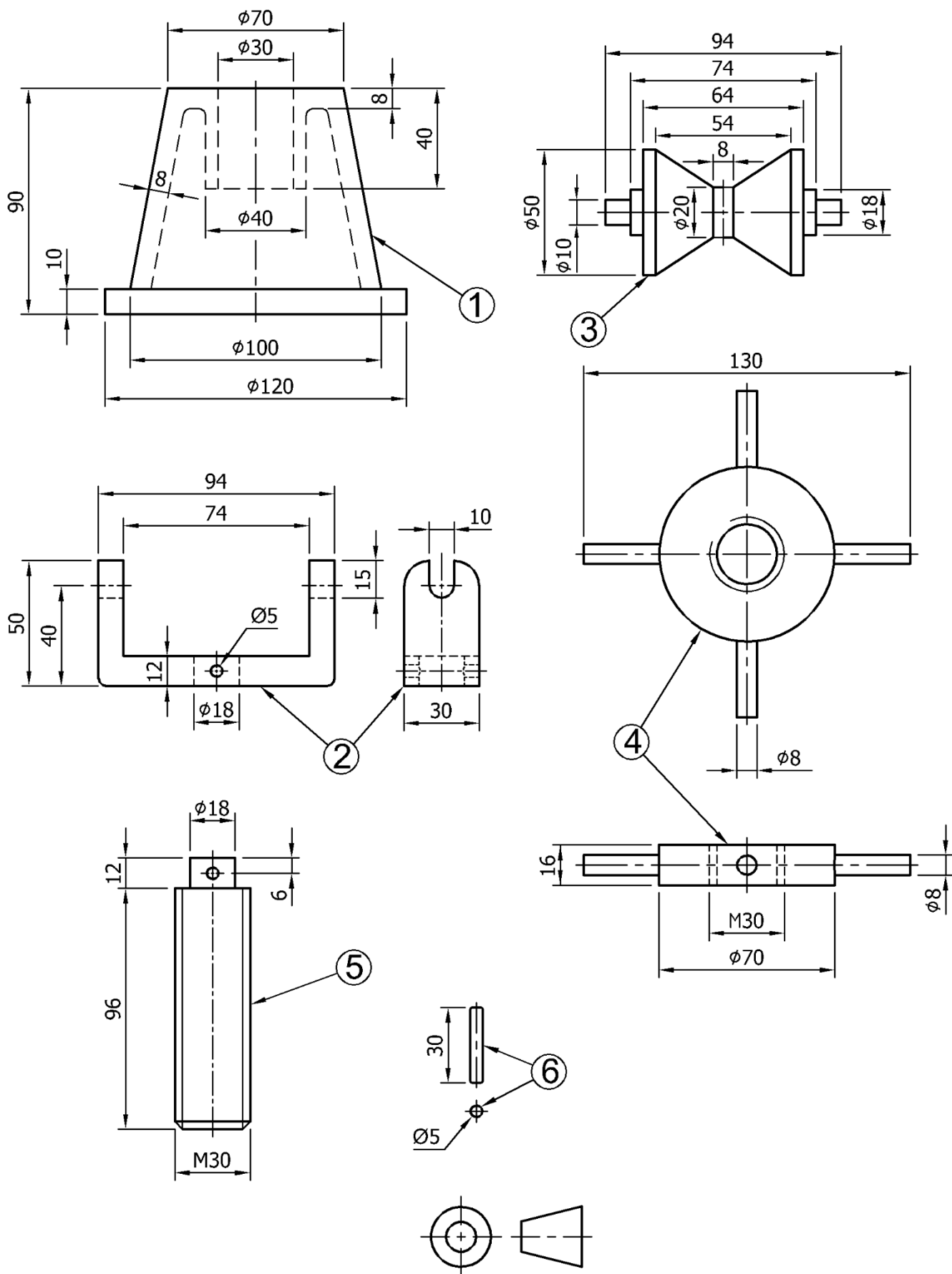


FIGURE 3

[30]

**QUESTION 4: DETAILED DRAWING**

FIGURE 4 shows the primary views of a pulley assembly.

Draw, to scale 1:1, detailed drawings of the following items in first-angle orthographic projection:

4.1 The base (Item 1) showing the following views:



4.1.1 A full-sectional front view (4)

4.1.2 A top view (4)

4.2 The support bracket (Item 2) showing a full-sectional front view (4)

Line work, accuracy, layout and neatness (8)

NO hidden detail is necessary.





**QUESTION 5: PERSPECTIVE DRAWING**

**NOTE:** This question must be answered on the prepared A4 ANSWER SHEET and attached to the DRAWING SHEET.



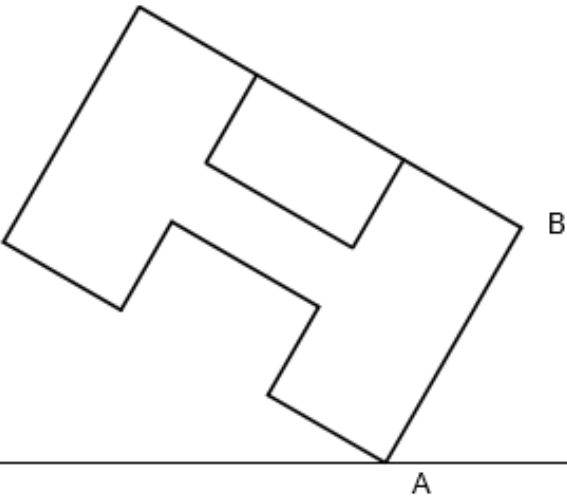
Use the information shown on the prepared ANSWER SHEET (attached) to draw a neat two-point perspective view of the machined block. Point A is situated in line with the centre of vision and up against the picture plane. Line AB vanishes to the right at  $60^\circ$ . The distance of the eye in front of the picture plane is 100 mm. NO hidden detail is necessary.

**[15]****TOTAL: 100**

ANSWER SHEET

EXAMINATION NUMBER:

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|
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HORIZON LINE/PICTURE PLANE

GROUND LINE

