higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

T1270(E)(A8)T
APRIL EXAMINATION

NATIONAL CERTIFICATE: MULTI-DISCIPLINARY DRAWING OFFICE PRACTICE

PICTORIAL DRAUGHTING

(8090214)

8 April 2013 (X-Paper)
09:00–13:00

REQUIREMENTS: **ONE sheet A4 draughting film or gateway tracing paper**
ONE sheet A2 drawing paper

CLOSED-BOOK EXAMINATION

This question paper consists of 4 pages, a 1-page formula and sheet 5 diagram sheets.

DEPARTMENT OF HIGHER EDUCATION AND TRAINING
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NATIONAL CERTIFICATE: MULTI-DISCIPLINARY DRAWING
OFFICE PRACTICE
PICTORIAL DRAUGHTING
TIME: 4 HOURS
MARKS: 100

INSTRUCTIONS AND INFORMATION

1. Answer ALL the questions.
2. Read ALL the questions carefully.
3. Use both sides of the drawing paper and answer QUESTION 1, 2 and 3 on the FRONT of the A2 drawing sheet, QUESTION 4 and 5 on the REVERSE of the A2 drawing sheet and QUESTION 6 on the draughting film supplied.
4. A balanced layout is very important and candidates will be penalised for poor planning.
5. A 15 mm border must be drawn on both sides around the drawing sheet.
6. Number the answers according to the numbering system used in this question paper.
7. All drawing work including candidate information must be completed in PENCIL on the A2 drawing paper and in DRAUGHTING INK on the A4 draughting film.
8. All drawing work must comply with the SABS 0111-1990 CODE OF PRACTICE.
9. On completion, fold the A2 sheet to A3 size with the examination number visible on the front. The draughting film must be placed inside the folded A2 sheet. NO STAPLES ARE TO BE USED.
10. Use your own discretion for dimensions not given.
11. Use a 3 mm fillet radius for all radii not given.
12. Write neatly and legibly.

QUESTION 1: FREEHAND DRAWING

FIGURE 1, DIAGRAM SHEET 1 (attached), shows two views of a valve body in THIRD-ANGLE orthographic projection. Draw a neat, freehand drawing, approximately one and a half times the given size of the sectional right view as shown in the diagram. **[14]**

QUESTION 2: TWO-POINT PERSPECTIVE DRAWING

FIGURE 2, DIAGRAM SHEET 2 (attached), shows two views of a guide block in FIRST-ANGLE orthographic projection. Draw, by using the measure point method, a TWO-POINT perspective drawing of the guide block. Point A is situated on the ground line (GL) 20 mm to the left of the centre of vision (CV) and up against the picture plane (PP). Line AB vanishes to the right at 45°. The distance of the eye in front of the picture plane (PP) is 130 mm and the height of the eye above the ground line (GL) is 100 mm. (16)

Show the necessary points on the construction, for example CV, VPs, et cetera. (4)

SCALE 1 : 1 **[20]**

QUESTION 3: ISOMETRIC PROJECTION

FIGURE 3, DIAGRAM SHEET 3 (attached), shows two views of a geometrical model in THIRD-ANGLE orthographic projection.

DO NOT copy the given views, but construct a suitable isometric scale.
Draw an isometric projection of the geometrical model. (2)
DO NOT show any hidden detail.
DO NOT insert any dimensions. (18)

SCALE 1 : 1 **[20]**

QUESTION 4: SQUARE THREAD CONSTRUCTION

FIGURE 4, DIAGRAM SHEET 4 (attached), shows a view of a machined part that has a right-hand square screw thread machined on the end. Do not copy the complete part, but draw to scale 3:1 only one and a half turns of the right-hand square screw thread machined on PART A to show the true helical curves of the screw thread.

The drawing must be placed vertically. Show ALL construction lines.

SCALE 3 : 1 **[14]**

QUESTION 5: GEAR TEETH CONSTRUCTION

FIGURE 5, DIAGRAM SHEET 5 (attached) shows a front view of an involute driven gear shaft made of mild steel. DO NOT copy the given drawing, but draw to scale 1 : 1 an outside right view to show two complete teeth of the gear constructed according to an approximate method. The remainder of the gear is to be drawn according to the conventional representation.

Note: Attention must also be given to the end view drawing of the M20 threaded section. (10)

Show ALL construction lines and calculations on the drawing paper. (4)

SCALE 1 : 1

[14]

QUESTION 6: INK DRAWING

FIGURE 1, DIAGRAM SHEET 1 (attached), shows two views of a valve body in THIRD-ANGLE orthographic projection. Draw, with draughting ink pens, according to scale 1 : 2, a full-sectional front view of the valve body.

Insert only four dimensions on the completed ink drawing.

Print or stencil a suitable title and scale centrally beneath the layout/drawing.

SCALE 1 : 2

[18]

TOTAL: 100

PICTORIAL DRAUGHTING N4

FORMULA SHEET

1. SCREW-THREAD CONSTRUCTION

Length = (pitch x number of turns) + pitch/2

Pitch divisions = pitch/12

2. GEAR TEETH CONSTRUCTION

Module = addendum

Dedendum = 1,25 x module

PCD = module x number of teeth

Fillet radius = 0,3 x module

Circular pitch = 3,142 x module

3. SQUARE SPRING CONSTRUCTION

Length = (lead x number of turns) + material thickness

DIAGRAM SHEET 1 (FREEHAND DRAWING AND INK DRAWING)

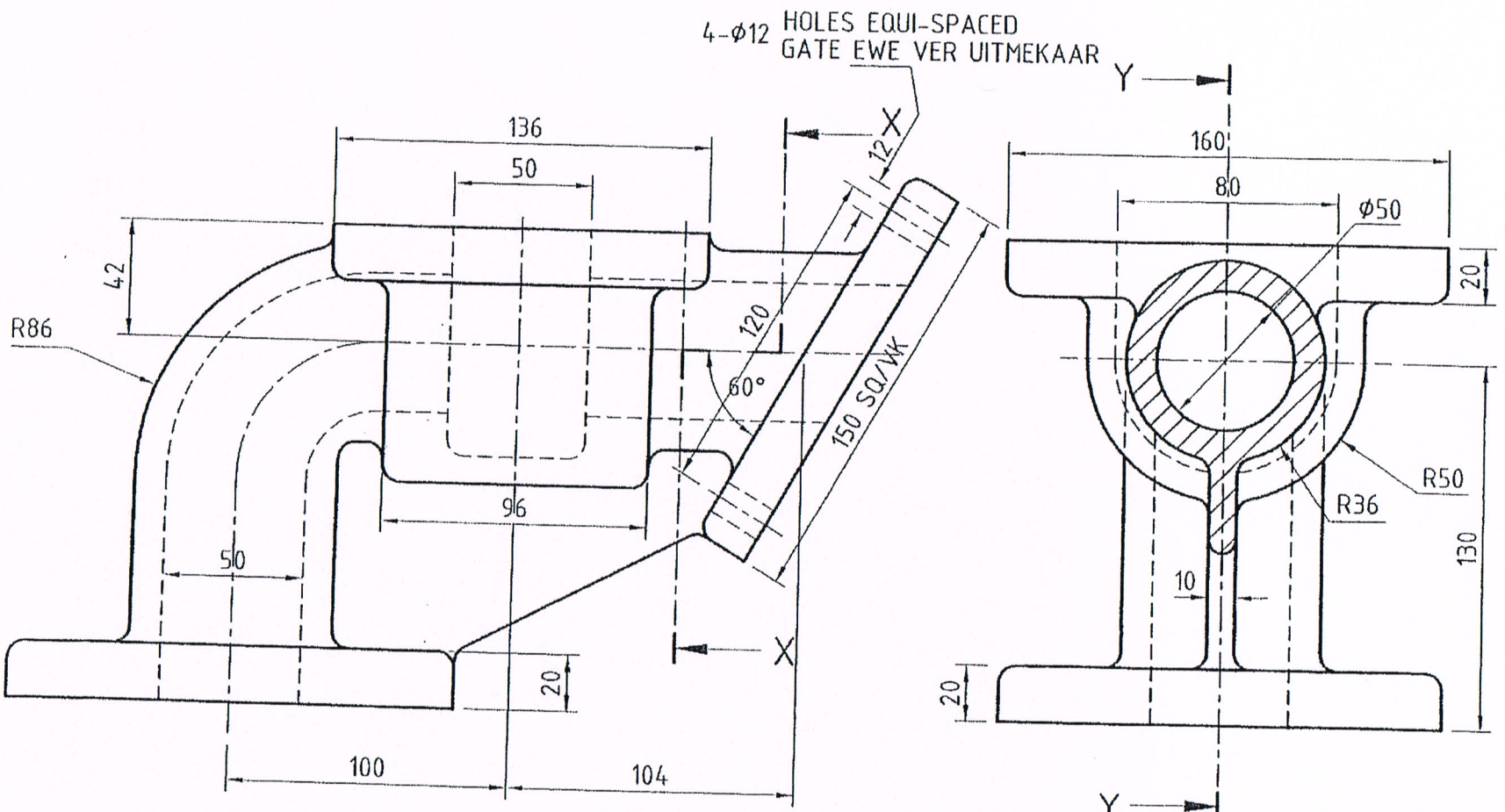

FIGURE 1

DIAGRAM SHEET 2 (TWO-POINT PERSPECTIVE DRAWING)

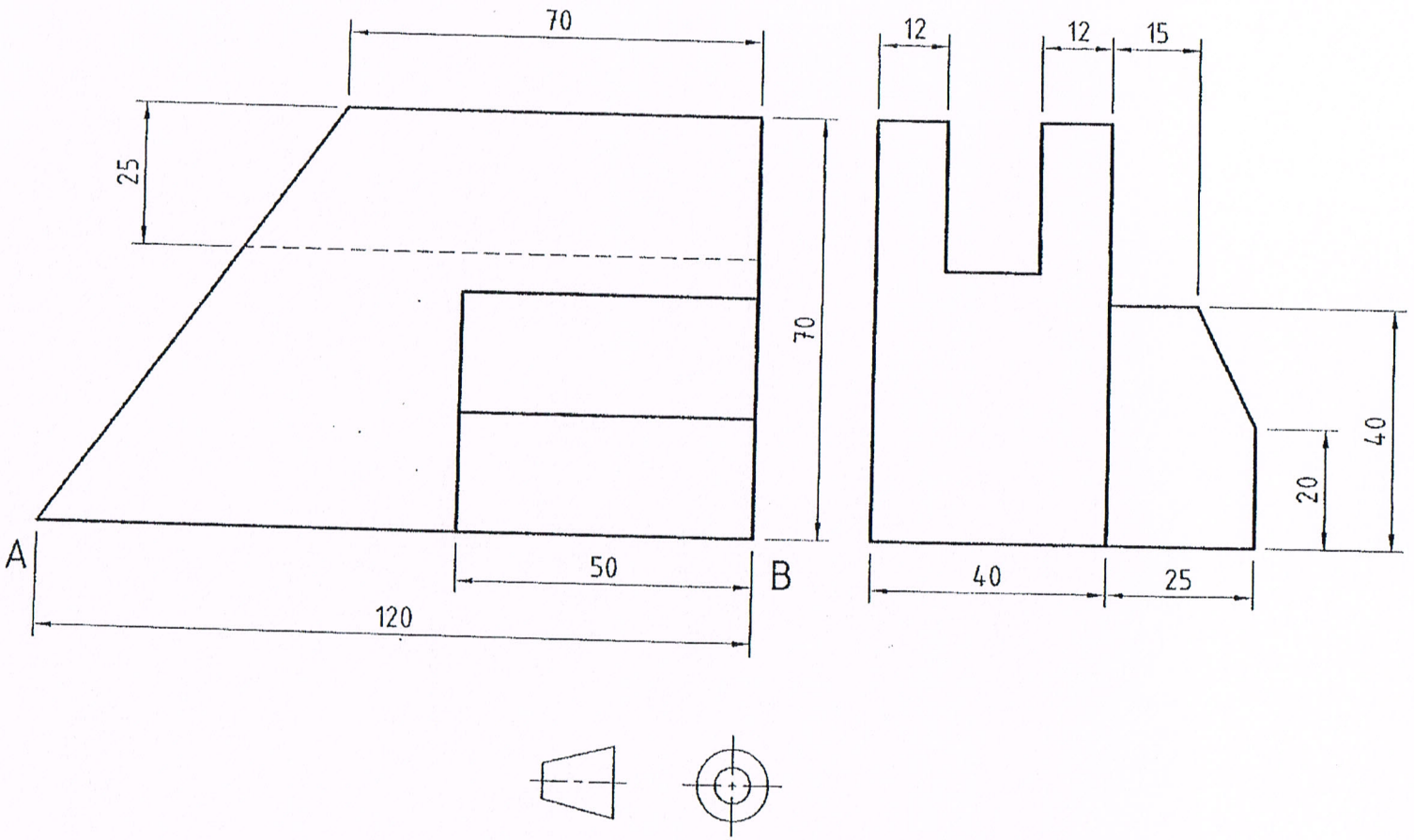

FIGURE 2

DIAGRAM SHEET 3 (ISOMETRIC PROJECTION)

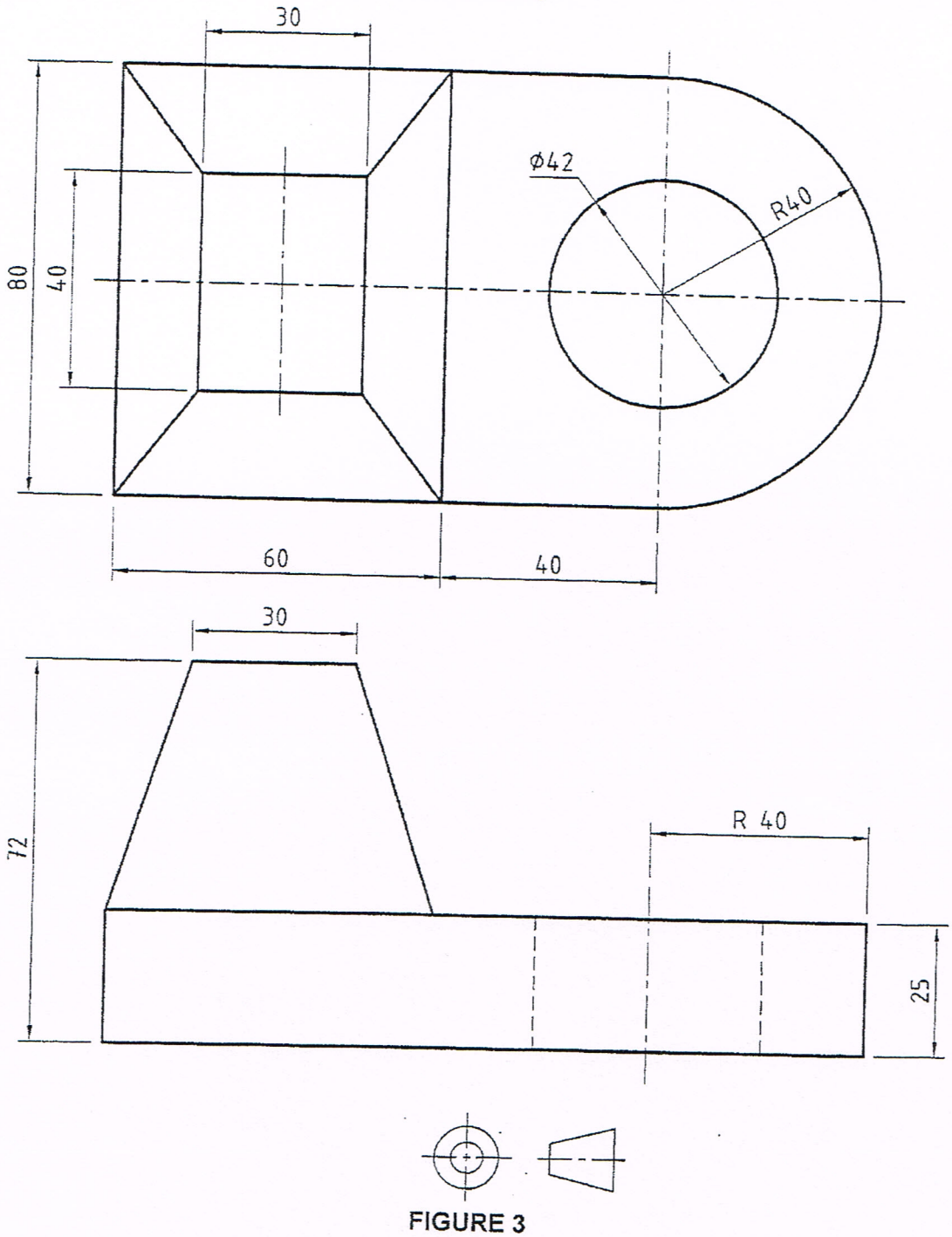

FIGURE 3

DIAGRAM SHEET 4 (SQUARE THREAD CONSTRUCTION)

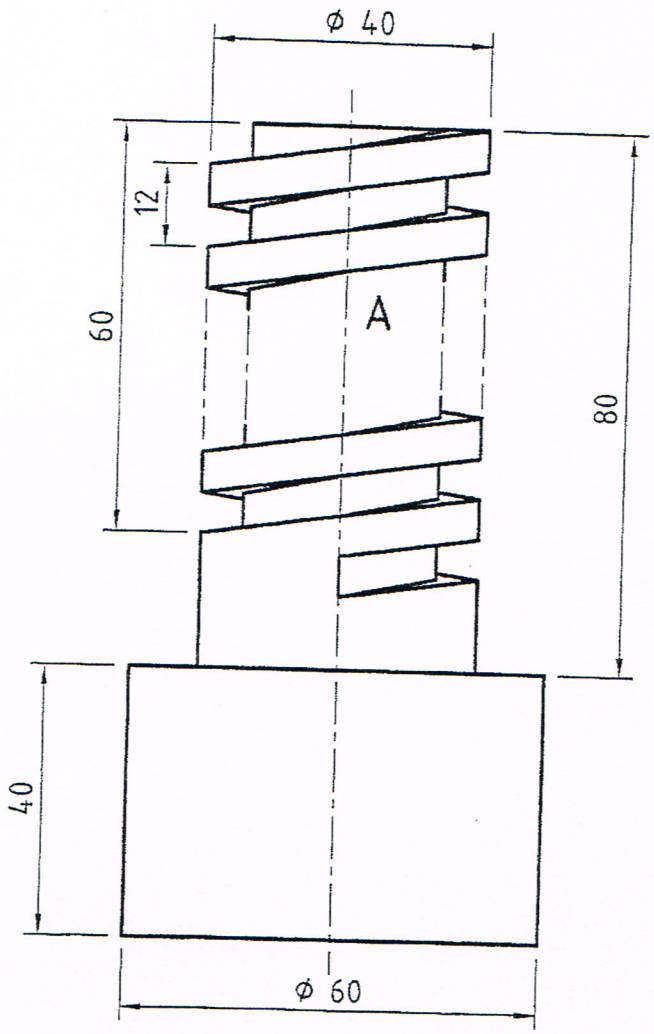

FIGURE 4

DIAGRAM SHEET 5 (GEAR CONSTRUCTION)

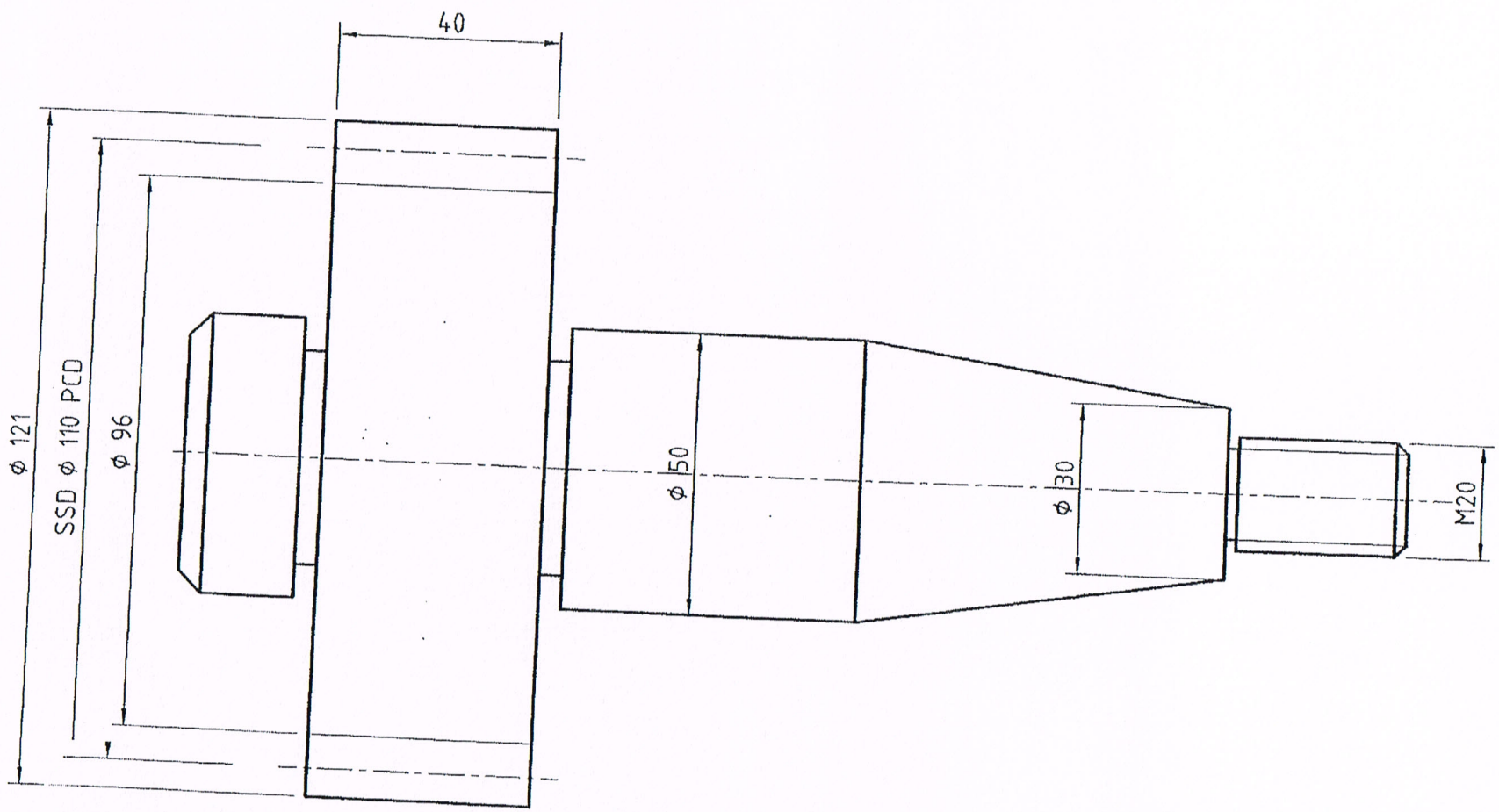

FIGURE 5