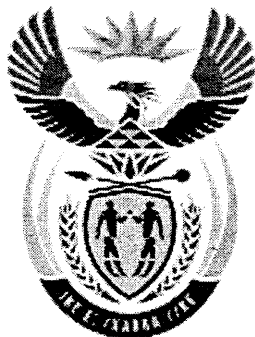


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# higher education & training

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

T1430(E)(N10)T  
**NOVEMBER 2011**

NATIONAL CERTIFICATE

**MECHANICAL DRAUGHTING N4**

(8090204)

**10 November (X-Paper)**  
**09:00 – 13:00**

**REQUIREMENTS: ONE sheet A2-drawing paper**

**Candidates will require drawing instruments, pencils and a ruler.**

**Calculators may be used.**

**This question paper consists of 5 pages and 3 diagram sheets.**

**DEPARTMENT OF HIGHER EDUCATION AND TRAINING**  
**REPUBLIC OF SOUTH AFRICA**  
NATIONAL CERTIFICATE  
MECHANICAL DRAUGHTING N4  
TIME: 4 HOURS  
MARKS: 100

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**INSTRUCTIONS AND INFORMATION**

1. Answer ALL the questions.
  2. Read ALL the questions carefully.
  3. ALL drawing work, including candidate information, must be done in pencil.
  4. ALL drawing work must conform to the latest SABS 0111 Code of Practice for Engineering Drawing.
  5. Use both sides of the drawing sheet.
  6. A 15 mm wide border must be drawn on both sides of the drawing sheet.
  7. Number the answers correctly according to the numbering system used in this question paper.
  8. A radius curve stencil may be used to draw smaller arcs.
  9. Unspecified radii must be 3 mm.
  10. A balanced layout is very important and candidates are advised to plan their layout accordingly.
  11. Estimate ALL dimensions not shown in a reasonable proportion.
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### QUESTION 1: SCREW THREADS

Draw, according to conventional representation and a scale of 1:1, a front view of a right-hand external square thread. The detail is as follows:

Nominal diameter : 60 mm  
Screw thread length : 100 mm  
Pitch : 20 mm

### QUESTION 2: DISC-CAM

A cam profile is required which will impart motion to a knife edge follower. Draw, according to scale 1:2, a full profile of the disc-cam using the following information:

#### CAM DATA

- Minimum diameter : 60 mm
- Stroke height (lift/fall) : 80 mm
- Performance: Rises 80 mm in 180° of cam rotation according to simple harmonic motion.  
Dwells for the next 60° of cam rotation.  
Falls 80 mm in the next 120° of cam rotation according to constant velocity.  
Rotation of cam is clockwise.

Show a displacement diagram and ALL construction lines. The displacement diagram must be drawn on the left hand side of the cam profile. The knife edge follower need not be drawn.

### QUESTION 3: SECTIONAL DRAWING

FIGURE 1, DIAGRAM SHEET 1 (attached), shows two views of a machined support. Draw, according to scale 1:1 and in first-angle orthographic projection, the following views of the machined support:

- 3.1 A sectional front view on cutting plane X - X
- 3.2 A sectional left view on cutting plane Y - Y

Insert only the following symbols and dimensions on the drawing:

At A: Show an 18 mm diameter holes with an upper deviation of 15 micrometer and a lower deviation of 20 micrometer.

#### QUESTION 4: DETAIL DRAWING

FIGURE 2, DIAGRAM SHEET 2 (attached), shows a front view and a sectional top view on cutting plane X - X of an expansion joint which consists of the following components:

Item 1	.....	Body
Item 2	.....	Sliding piece
Item 3	.....	Gland
Item 4	.....	Stop bolt
Item 5	.....	Stud
Item 6	.....	Hexagon nut
Item 7	.....	Packing

Draw, according to scale 1:1 and in third-angle orthographic projection, detail drawings of the following components:

- 4.1 The body (item 1) showing the following:
  - 4.1.1 A full sectional front view
  - 4.1.2 A right view
- 4.2 The gland (item 3) showing the following:
  - 4.2.1 A half sectional front view with the right hand half in section
  - 4.2.2 A top view

NO hidden detail is required.

#### QUESTON 5: ASSEMBLY DRAWING

FIGURE 3, DIAGRAM SHEET 3 (attached), shows the components of a cable trolley drawn in first-angle orthographic projection. The complete parts list is as follows:

ITEM	PART	AMOUNT	MATERIAL
Item 1	Side plate	2 off	mild steel
Item 2	Cable wheel	2 off	cast steel
Item 3	Bush	2 off	cast steel
Item 4	Suspending bracket	1 off	brass
Item 5	Shaft	3 off	tensile steel
Item 6	Hexagon nut	6 off	mild steel
Item 7	Hexagon lock-nut	6 off	mild steel

Make an assembly drawing according to scale 1:1, showing a sectional left view of the cable trolley, on cutting plane X - X seen on item 1.

Item numbers must be indicated on the assembly drawing.

A complete parts list must be shown below the assembly drawing.

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Layout, neatness and general impression of the ANSWER SHEET.

**TOTAL: 1**

# DIAGRAM SHEET 1

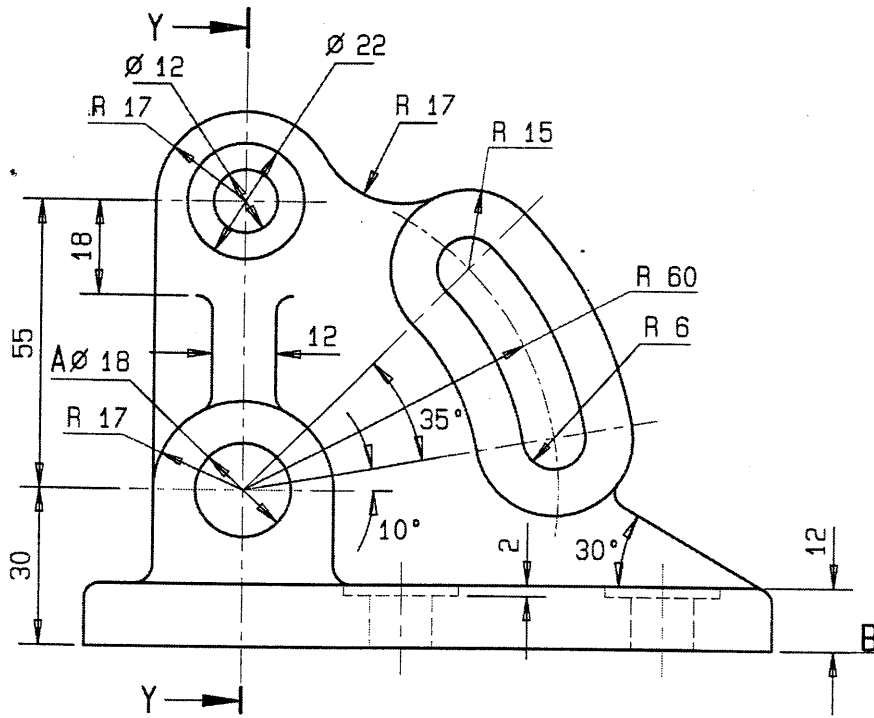
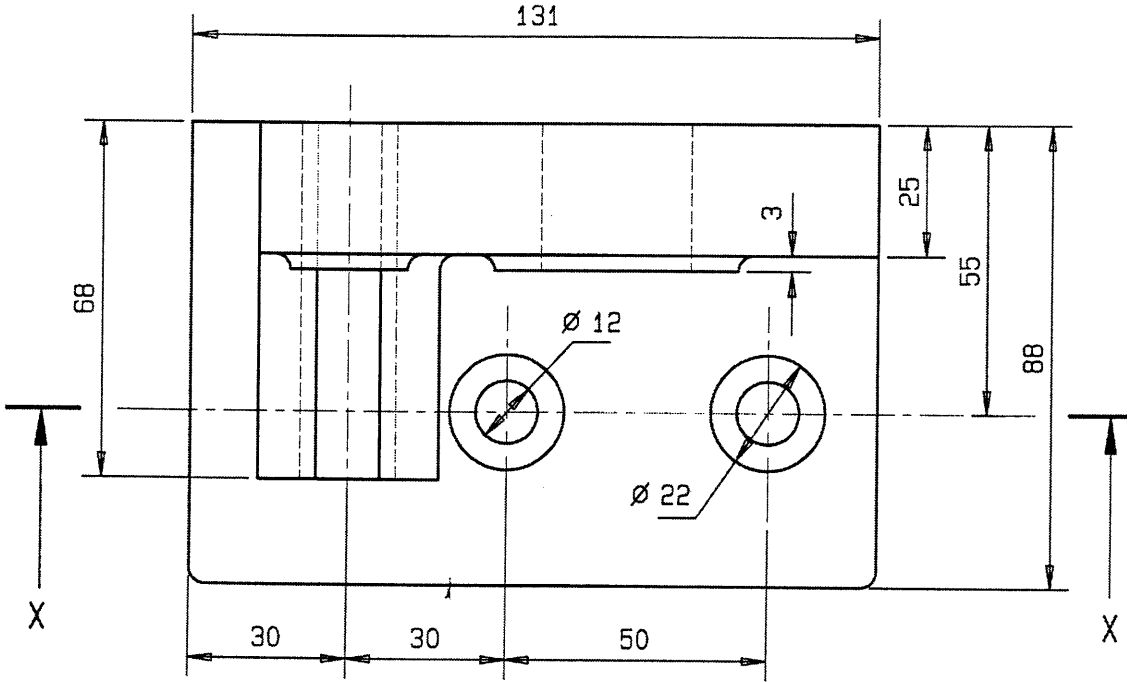
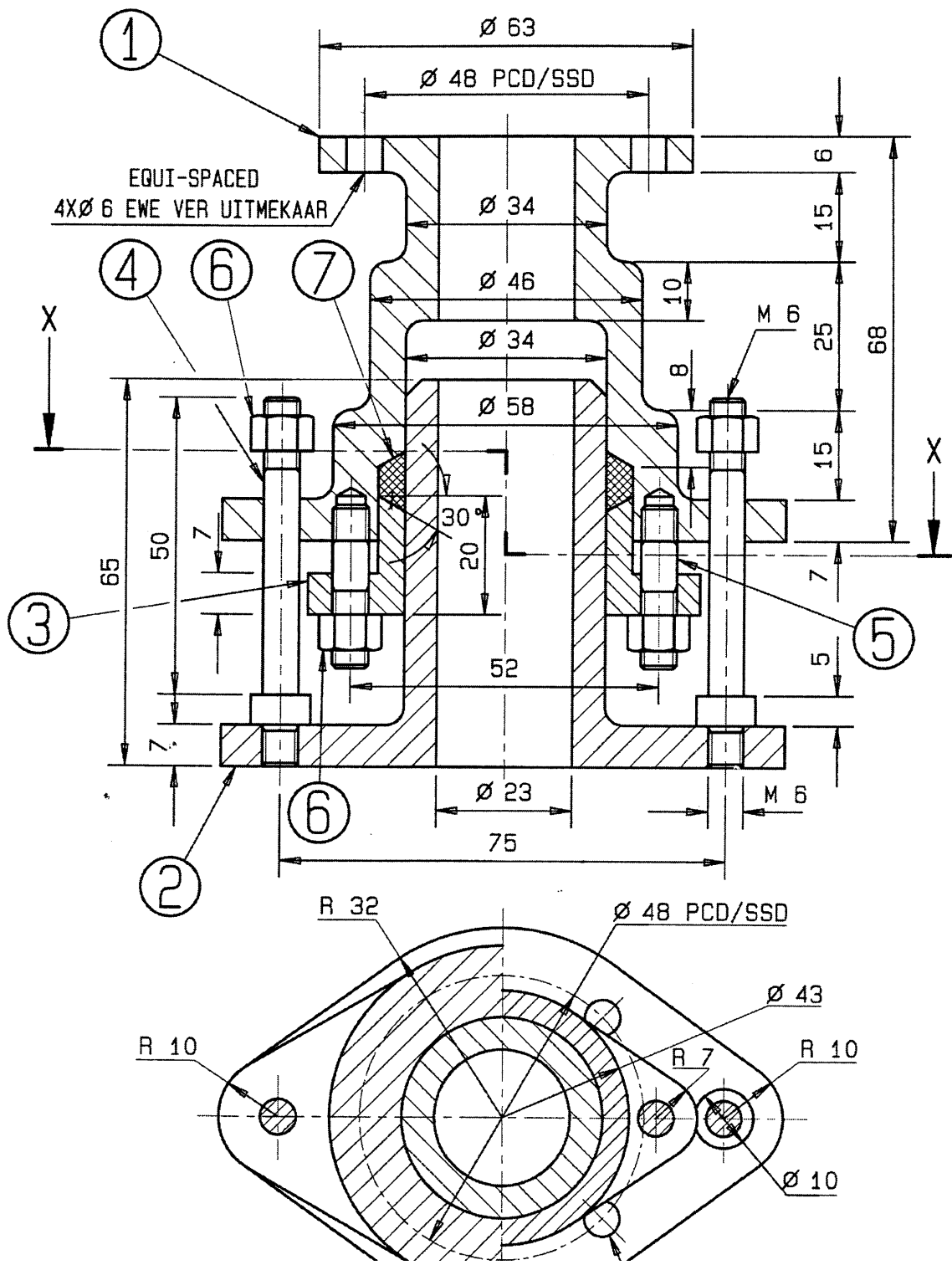


DIAGRAM SHEET 2



## DIAGRAM SHEET 3

