



higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

T460(E)(N15)T

NATIONAL CERTIFICATE

ENGINEERING DRAWING N2

(8090272)

15 November 2016 (X-Paper)

09:00–13:00

REQUIREMENTS: ONE A2 DRAWING SHEET

Calculators may be used.

Candidates need drawing instruments

This question paper consists of 7 pages.

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

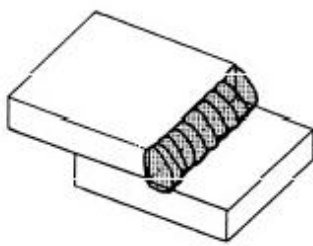
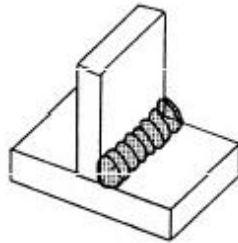
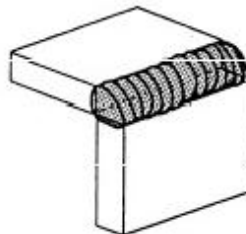
INSTRUCTIONS AND INFORMATION

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. ALL drawing work, including candidate information, must be done in pencil.
 5. Marks will be deducted for untidy work.
 6. A radius curve stencil may be used to draw smaller arcs.
 7. Unspecified radii must be R3.
 8. ALL drawings must conform to the latest SANS 10111 Codes of Practice.
 9. ALL work you do not want to be marked must be clearly crossed out.
-

QUESTION 1: WELDING, COMPUTER AIDED DRAUGHTING, FASTENERS AND FITTINGS

1.1 Name THREE welding processes you can use to join metal. (3)

1.2 Name the types of welded joints shown in FIGURE 1. Write only the answer next to the question number (1.2.1–1.2.4) on the ANSWER SHEET.

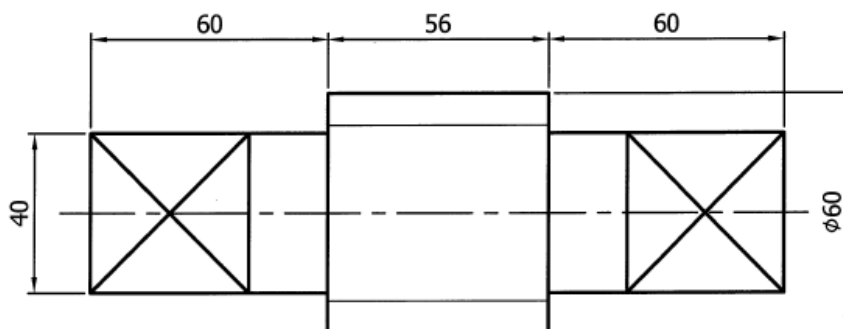
**1.2.1****1.2.2****1.2.3****1.2.4****FIGURE 1**

(4)

1.3 Make a neat freehand drawing of a two way T- end box. (4)

[11]**QUESTION 2: SCREWTHREADS**

FIGURE 2 shows a machined spindle. Draw the given view to a scale of 1 : 1. Provide the 56 mm shank length with a single start external right hand square screw thread with a pitch of 16 mm.

**FIGURE 2****[12]**

QUESTION 3: FIRST ANGLE ORTHOGRAPHIC PROJECTION

FIGURE 3 shows an outside front view and an outside top view of a Driving Coupling, without an M16 nut shown in position.

- 3.1 Draw to scale 1 : 1 and in first angle orthographic projection the following views:
- 3.1.1 A full-sectional front view on cutting plane B–B with the M16 nut in position. (11)
- 3.1.2 A full-sectional top view on cutting plane A–A. (9)
- 3.2 Insert any SIX dimensions on both views. (3)
- 3.3 Insert the following title and scale beneath the layout:
DRIVING COUPLING
SCALE 1 : 1 (2)
- 3.4 Draw the projection symbol for first angle orthographic projection beneath the layout. (1)
- No hidden detail is required

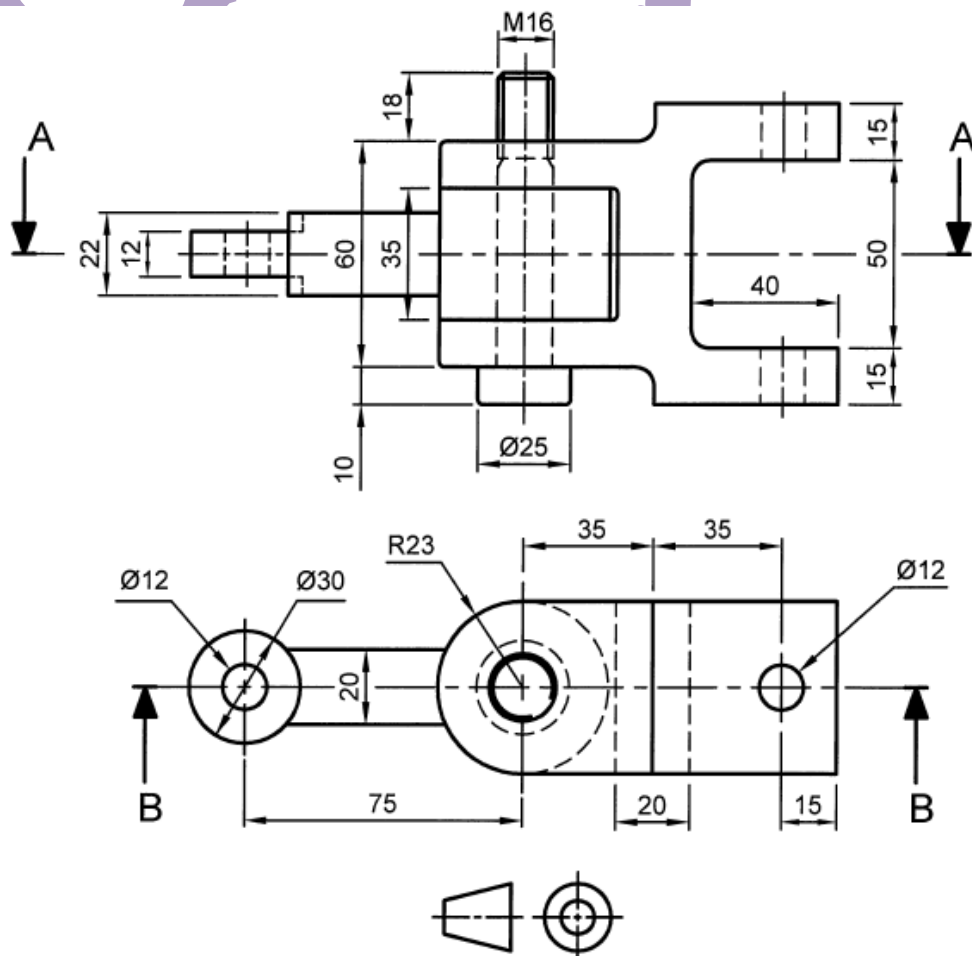


FIGURE 3

[26]

QUESTION 4: ISOMETRIC

FIGURE 4 shows two views of a work piece in first angle orthographic projection.

Draw to scale 1 : 1 an isometric view of the work piece.

Point P must be the lowest point.

No hidden detail is required.

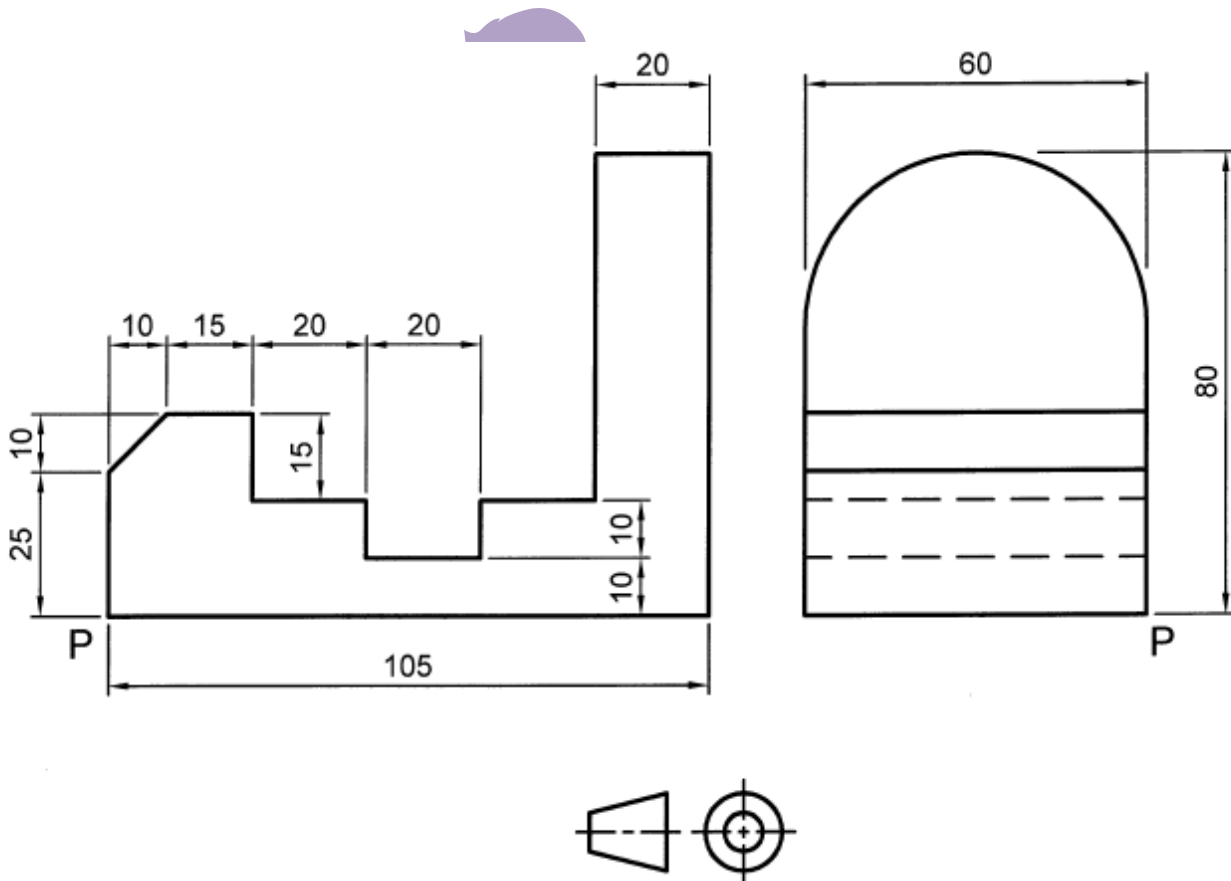


FIGURE 4

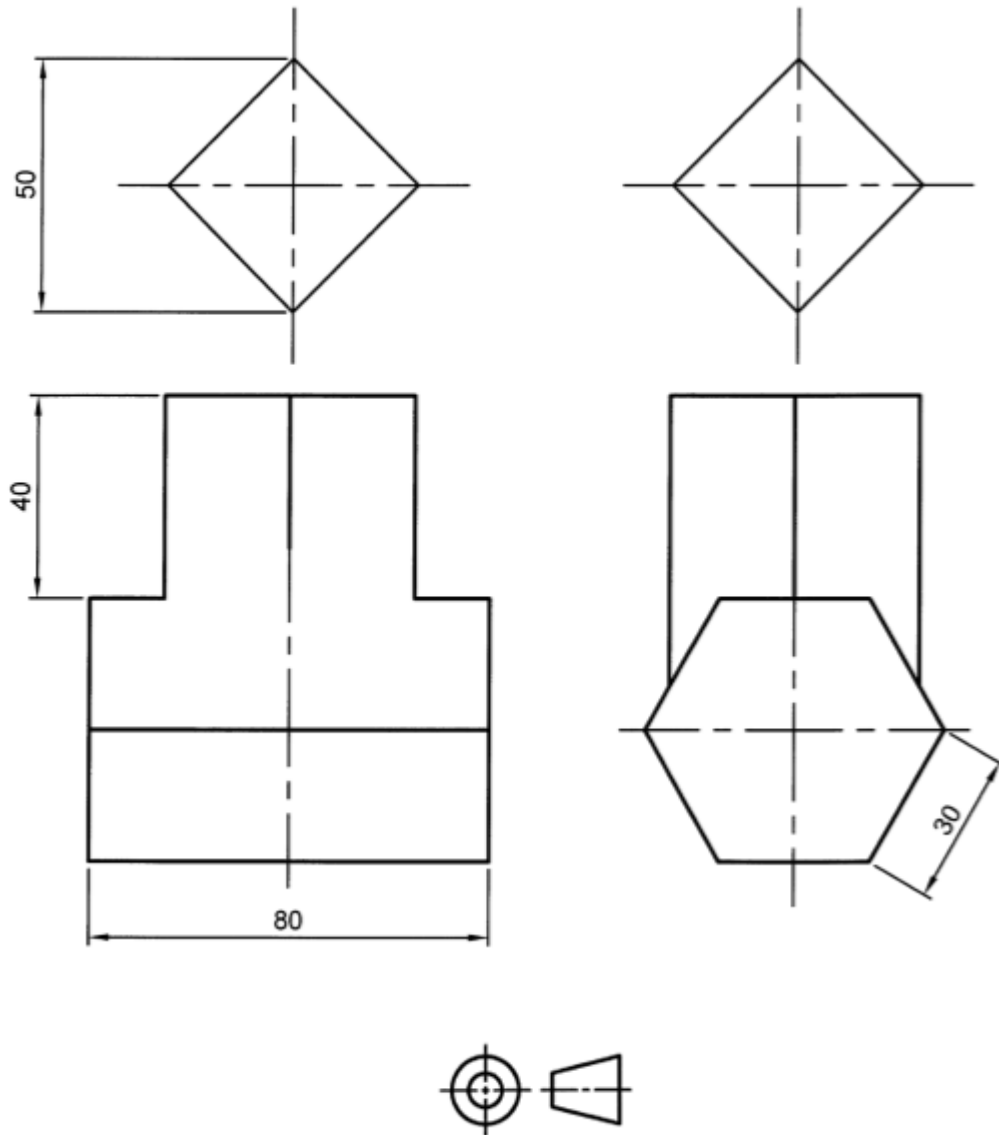
[14]

QUESTION 5: INTERPENETRATION

FIGURE 5 shows an incomplete front view and a right view of a square pipe penetrating a hexagon T- Piece. The curves of interpenetration are missing.

Redraw the two views in first angle orthographic projection to scale 1 : 1, showing the curves of interpenetration.

Show all the construction lines on the drawing.

**FIGURE 5****[12]**

QUESTION 6: THIRD ANGLE ORTOGRAPHIC PROJECTION AND MACHINING SYMBOLS

Figure 6 shows the outside front and top views of a Coupling.

- 6.1 Draw to scale 1 : 1 and in third angle orthographic projection the following views of the Coupling:
- 6.1.1 A full-sectional front view on cutting plane A–A. (8)
 - 6.1.2 A full-sectional right view on cutting plain B–B. (10)
 - 6.1.3 An outside top view. (6)
- 6.2 Draw the third angle orthographic projection symbol centrally beneath the drawing. (1)

No hidden detail is required

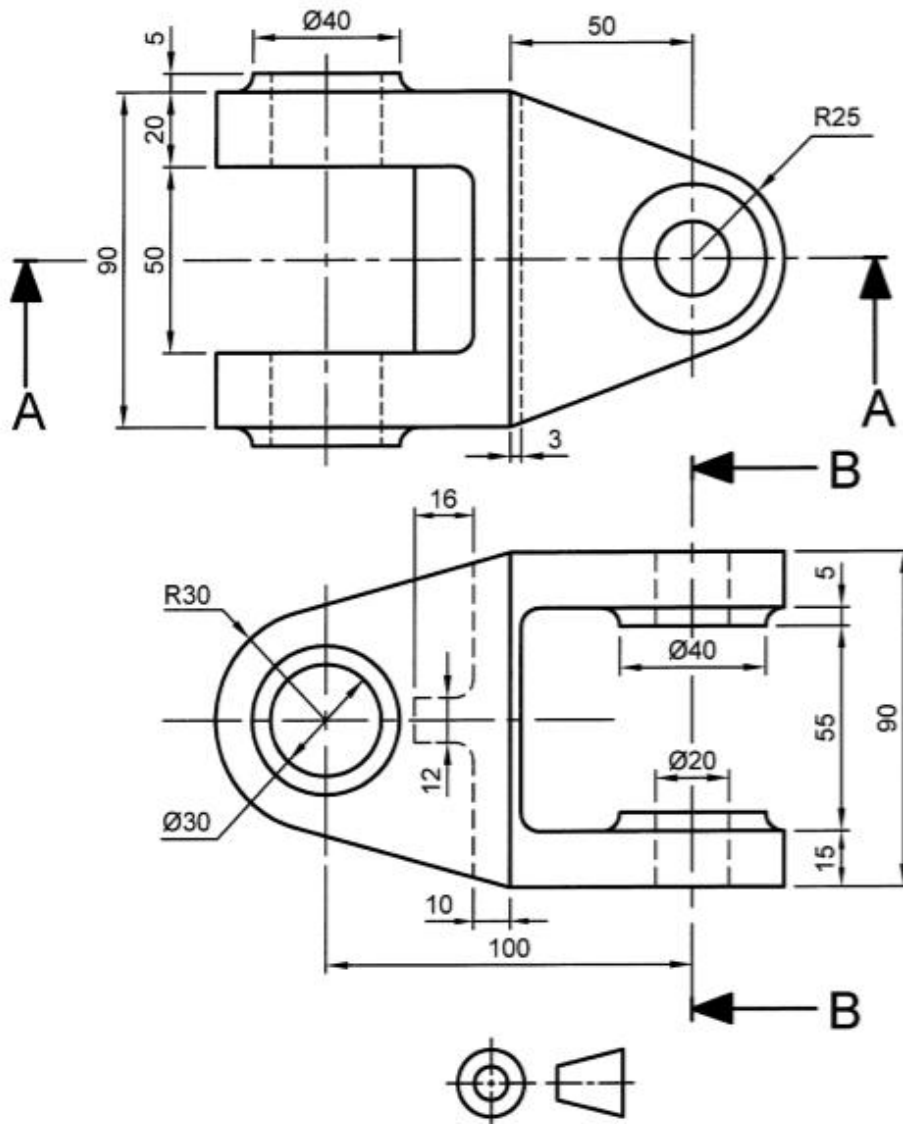


FIGURE 6

[25]

TOTAL [100]