



**higher education
& training**

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

**NATIONAL CERTIFICATE
ENGINEERING DRAWING N3**

(8090283)

**24 November 2022 (X-paper)
09:00–13:00**

REQUIREMENTS: One sheet of A2 drawing paper.

Drawing instruments may be used.

This question paper consists of 10 pages.

199Q1E2224

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ENGINEERING DRAWING N3
TIME: 4 HOURS
MARKS: 100

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

QUESTION 1: FREEHAND DRAWING		[10]
Correctness		4
Line work		3
Accuracy and proportion		3
QUESTION 2: SECTIONAL DRAWING		[25]
Correctness	Full-sectional front view	5
	Full-sectional top view	6
	Full-sectional left view	6
Line work		3
Accuracy		3
Layout and neatness		2
QUESTION 3: ASSEMBLY DRAWING		[30]
Correctness		18
Line work		5
Accuracy		5
Layout and neatness		2
QUESTION 4: DETAILED DRAWING		[20]
Correctness	Full-sectional front view (Item 1)	5
	Full-sectional left view (Item 1)	3
	Half-sectional front view (Item 2)	4
Line work		3
Accuracy		3
Layout and neatness		2
QUESTION 5: ISOMETRIC PROJECTION		[15]
Correctness		8
Line work		2
Accuracy		2
Scale		2
Point P		1
TOTAL:		100

QUESTION 1: FREEHAND DRAWING

FIGURE 1 shows a full-sectional view of a universal coupling.

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

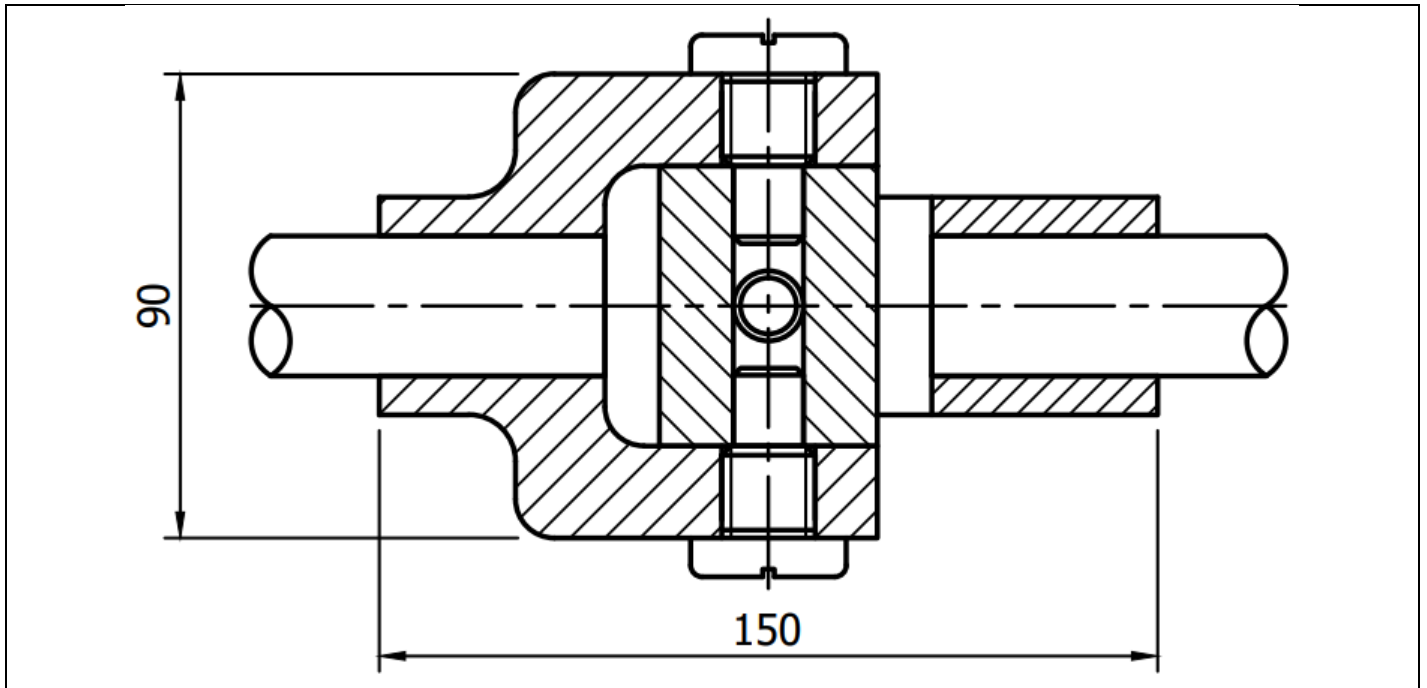


FIGURE 1

[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 first-angle orthographic projection:



2.1 A full-sectional front view (5)

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

2.3 A full-sectional left view on cutting plane Y–Y (6)

Line work, accuracy, layout and neatness (8)

No hidden detail is required.

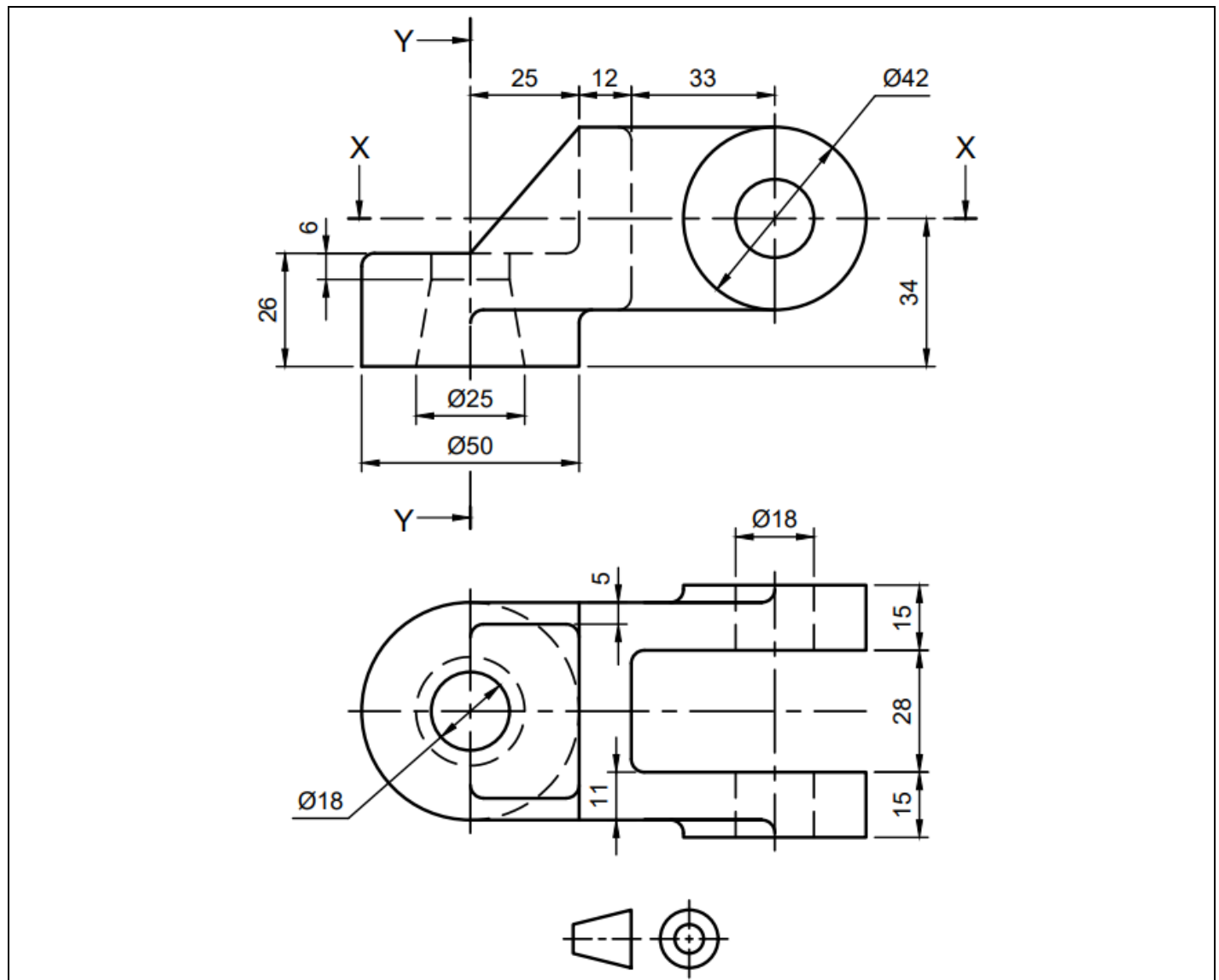


FIGURE 2

[25]



QUESTION 3: ASSEMBLY DRAWING

FIGURE 3 shows primary views of the components of a punch set.

The complete list of parts is as follows:



ITEM	DESCRIPTION	QUANTITY
1	Upper body	1
2	Lower body	1
3	Plunger	1
4	Cap	1
5	Cutter die	1
6	Washer	1
7	M14 hexagon head bolt	1

Draw to scale 1:1, a full-sectional front view of the punch set assembly. Surface P on Item 3 must be 10 mm above the cutter die (Item 5).

No hidden detail is required.



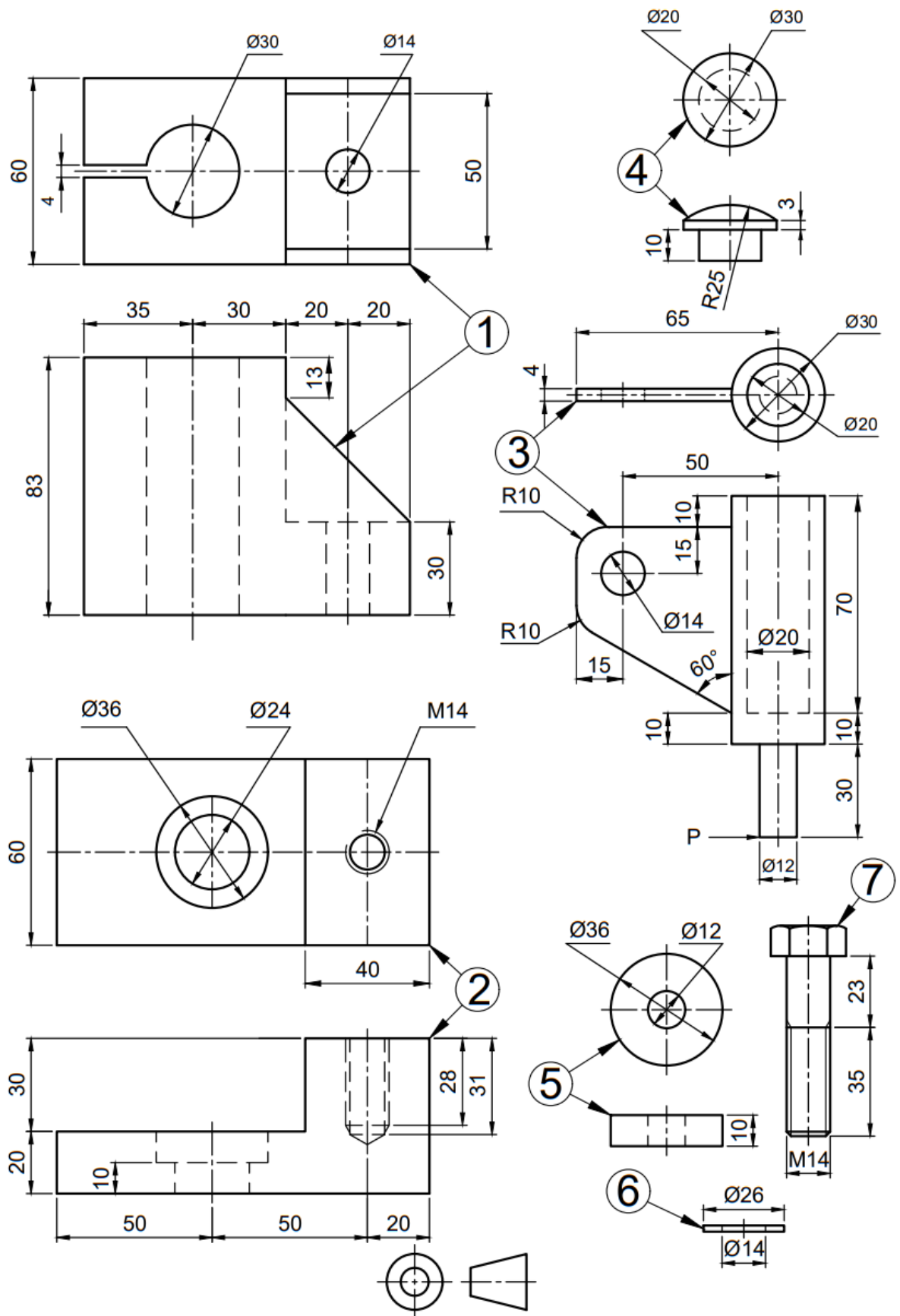


FIGURE 3

[30]

QUESTION 4: DETAILED DRAWING

FIGURE 4 shows two primary views of an overhead swivel-pulley assembly.

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



4.1 The hanger bracket (Item 1) showing the following views:

4.1.1 A full-sectional front view

(5)



4.1.2 A full-sectional left view

(3)

4.2 The mounting plate (Item 2) showing a half-sectional front view with the right half in section

(4)

No hidden detail is necessary.

Line work, accuracy, layout and neatness

(8)

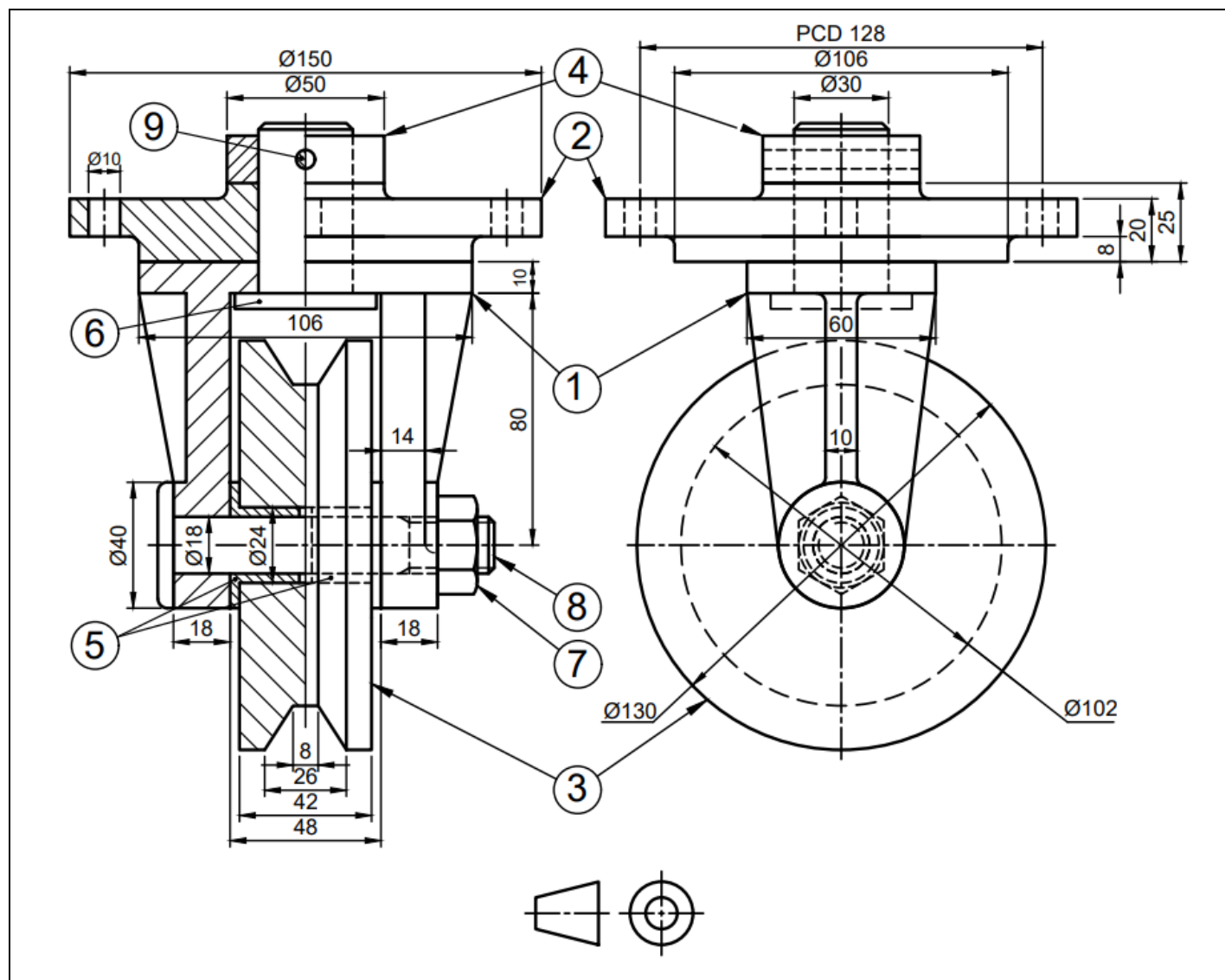


FIGURE 4

[20]



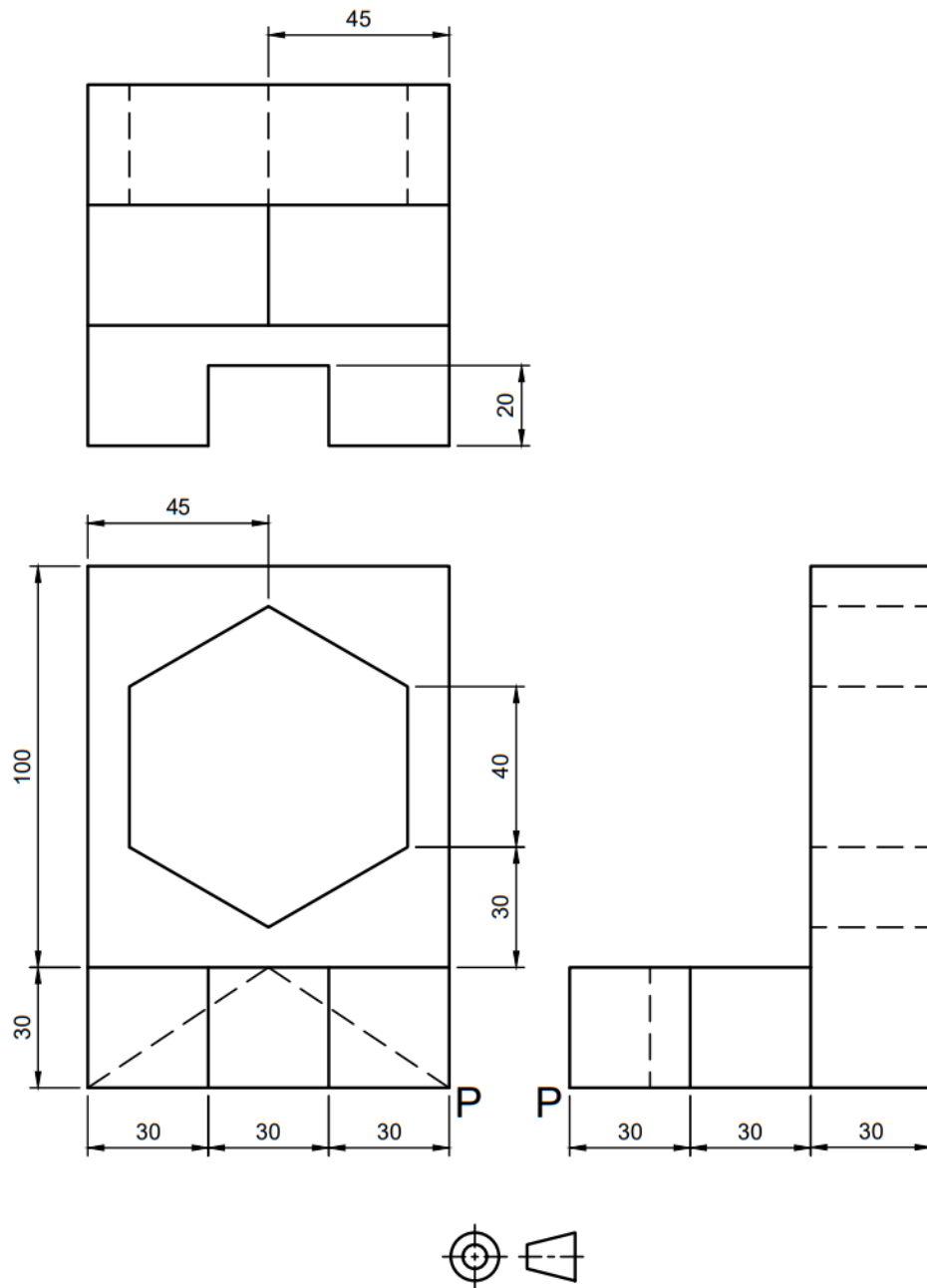
QUESTION 5: ISOMETRIC PROJECTION

FIGURE 5 shows two primary views of a geometric model.

Construct an isometric scale and then draw an isometric projection of the model.
Point P must be the lowest point in your drawing.

Draw an auxiliary view to determine the angle of the non-isometric lines.

No hidden detail is necessary.

**FIGURE 5****[15]**