



# higher education & training

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

**T590(E)(M20)T**

**NATIONAL CERTIFICATE**

**ENGINEERING DRAWING N3**

**(8090283)**

**20 March 2018 (X-Paper)**

**09:00–13:00**

**REQUIREMENTS: ONE A2 drawing sheet**

**Calculators and drawing instruments may be used.**

**This question paper consists of 9 pages.**

**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. ALL drawing work, including candidate information, must be done in pencil.
  7. A radius curve stencil may be used 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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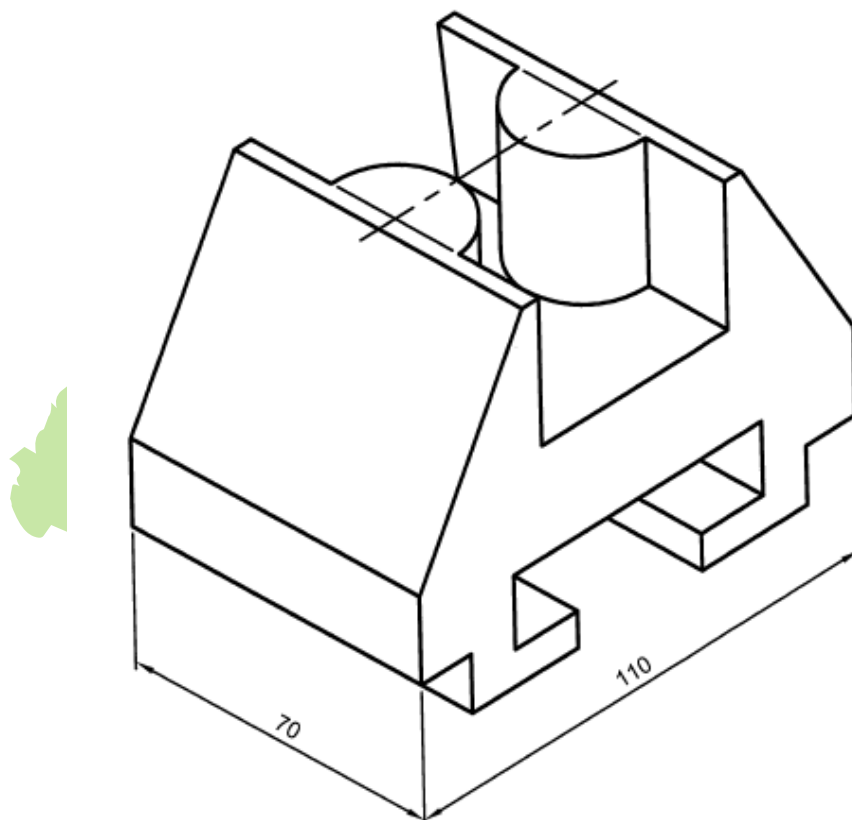
**MARK ALLOCATION**

<b>QUESTION 1: FREEHAND DRAWING</b>		
	Correctness	(4)
	Line work	(3)
	Accuracy and proportion	(3)
		<b>[10]</b>
<b>QUESTION 2: SECTIONAL DRAWING</b>		
2.1	Correctness – Full-sectional front view	(7)
2.2	Correctness – Full-sectional left view	(5)
2.3	Correctness – Full-sectional top view	(5)
	Line work	(3)
	Accuracy	(3)
Layout and neatness		(2)
		<b>[25]</b>
<b>QUESTION 3: ASSEMBLY DRAWING</b>		
	Correctness	(18)
	Line work	(5)
	Accuracy	(5)
	Layout and neatness	(2)
		<b>[30]</b>
<b>QUESTION 4: DETAILED DRAWING</b>		
4.1	Correctness – Full-sectional front view (Item 2)	(5)
4.2	Correctness – Full-sectional front view (Item 3)	(4)
4.3	Correctness – Full-sectional right view (Item 3)	(3)
	Line work – 1 mark per view	(3)
	Accuracy – 1 mark per view	(3)
Layout and neatness		(2)
		<b>[20]</b>
<b>QUESTION 5: ISOMETRIC PROJECTION</b>		
	Correctness	(9)
	Line work	(2)
	Accuracy	(2)
	Scale	(2)
		<b>[15]</b>
<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**

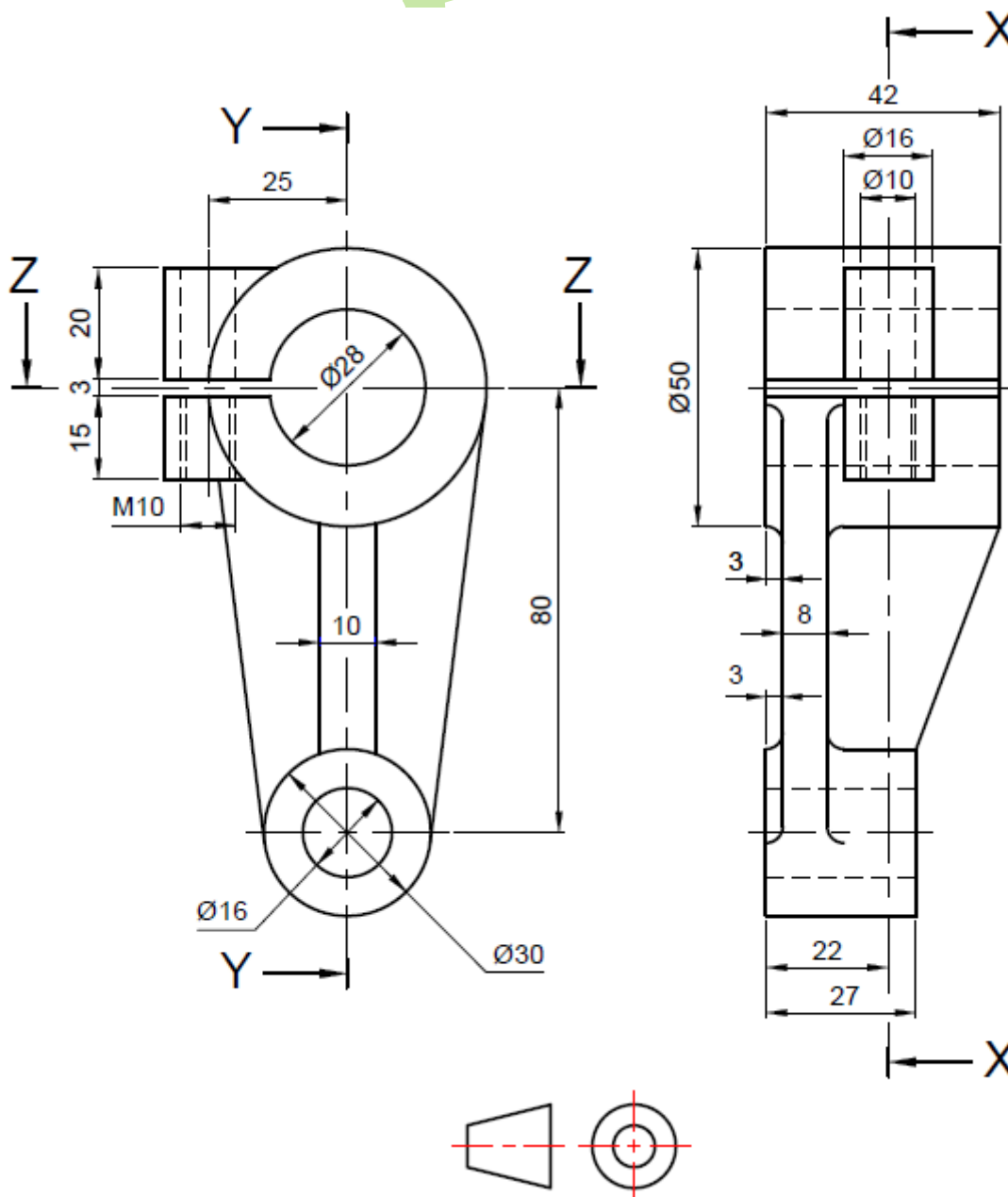
**[10]**

**QUESTION 2: SECTIONAL DRAWING**

FIGURE 2 shows TWO primary views of a bracket.

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

- 2.1 A full-sectional front view on cutting plane X-X (9)
- 2.2 A full-sectional left view on cutting plane Y-Y (8)
- 2.3 A full-sectional top view on cutting plane Z-Z (8)

**FIGURE 2****[25]**

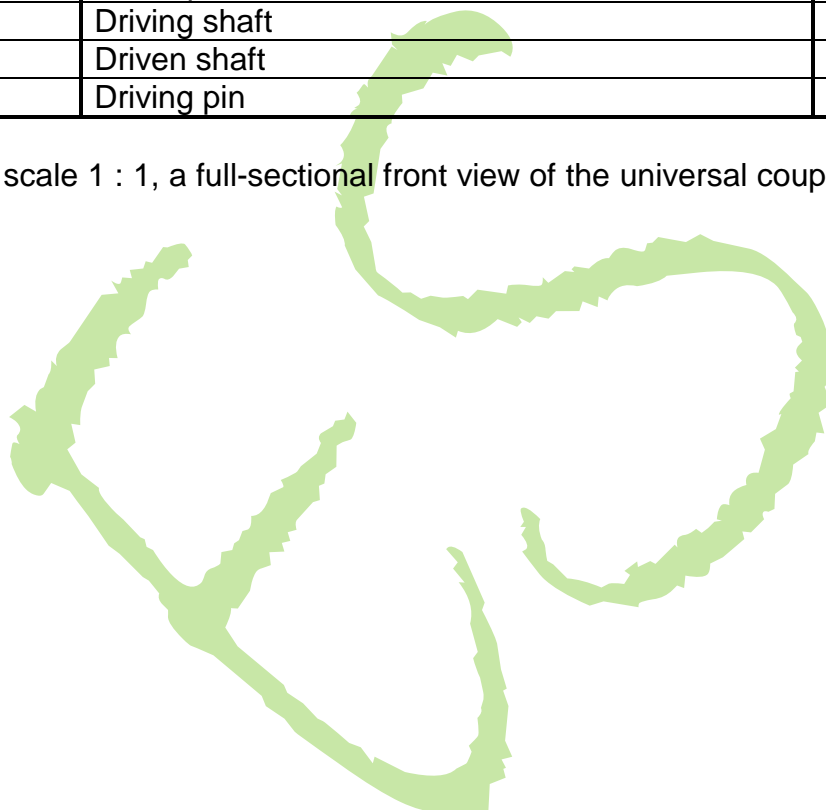
**QUESTION 3: ASSEMBLY DRAWING**

FIGURE 3 shows the primary views of the components of a universal coupling.

The complete list of parts is as follows:

ITEM	DESCRIPTION	QUANTITY
1	Forked end (driving)	1
2	Forked end (driven)	1
3	Cross piece	1
4	Driving shaft	1
5	Driven shaft	1
6	Driving pin	4

Draw, to scale 1 : 1, a full-sectional front view of the universal coupling as an assembly drawing.



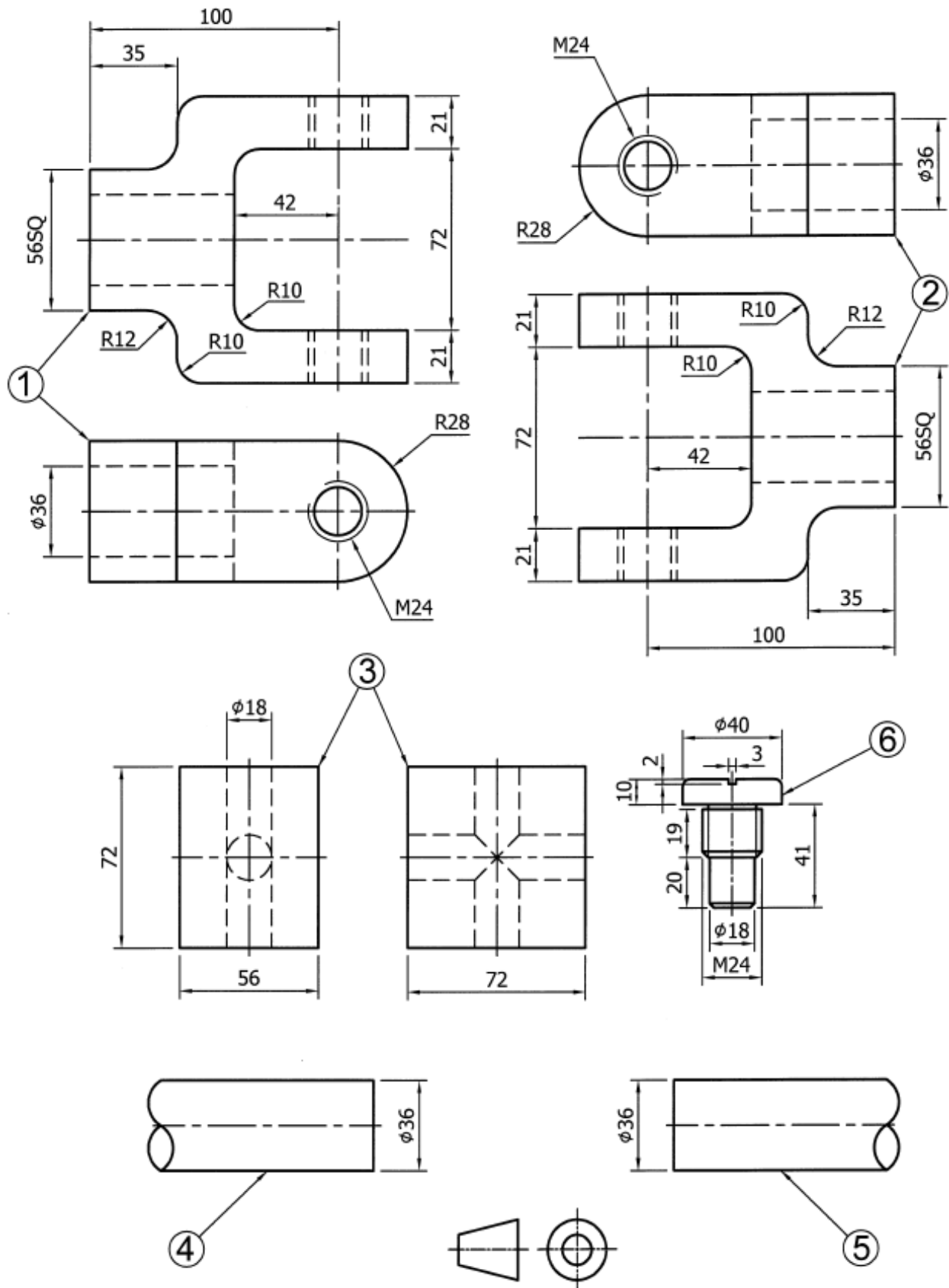


FIGURE 3

[30]

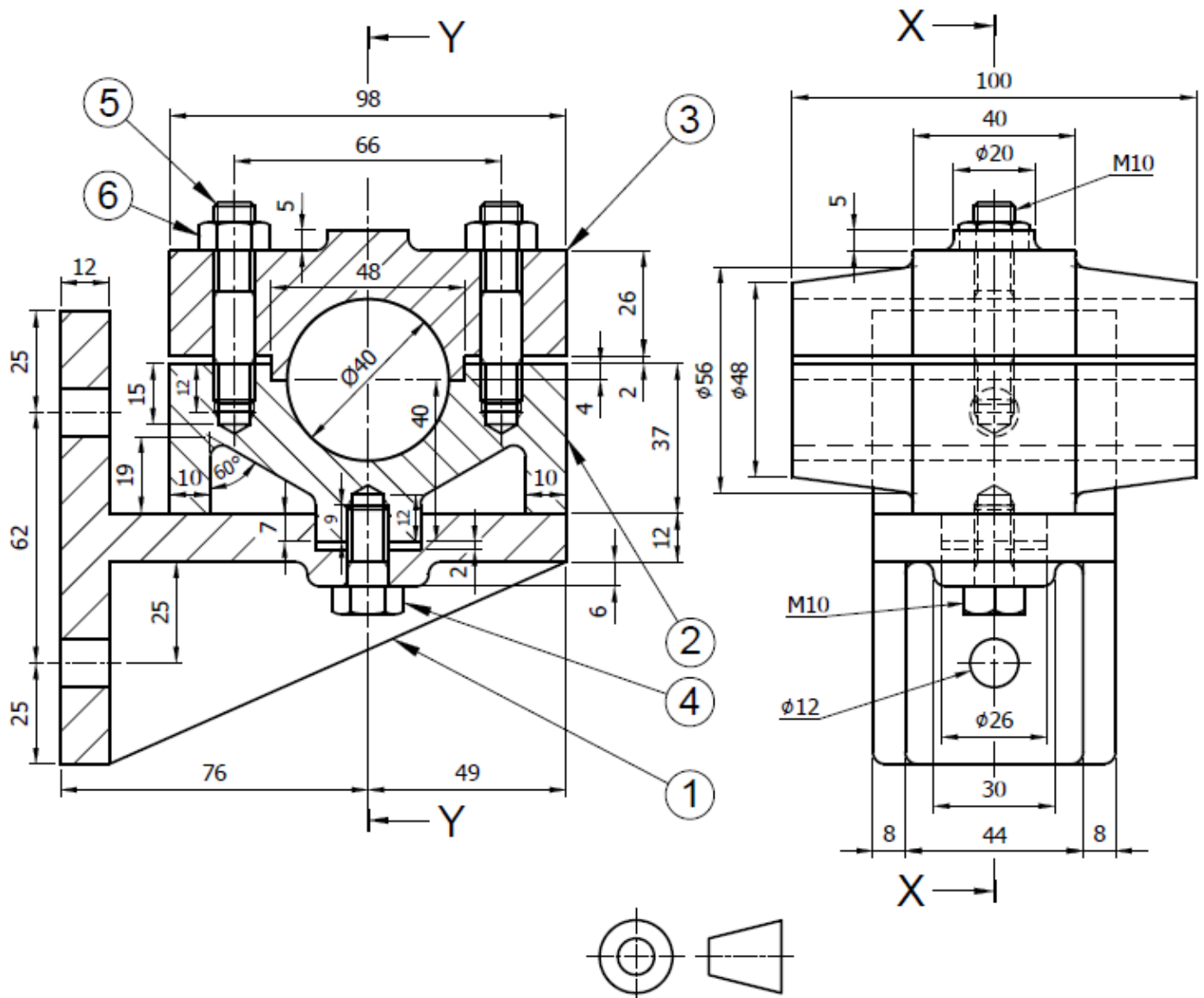
### QUESTION 4: DETAILED DRAWING

FIGURE 4 shows TWO primary views of a swivel bearing assembly.

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

- 4.1 The bottom block (Item 2) showing a full-sectional front view on cutting plane X-X (8)
- 4.2 The top block (Item 3) showing the following views:
  - 4.2.1 A full-sectional front view on cutting plane X-X (6)
  - 4.2.2 A full-sectional right view on cutting plane Y-Y (6)

NO hidden detail is necessary.



**FIGURE 4**

**[20]**



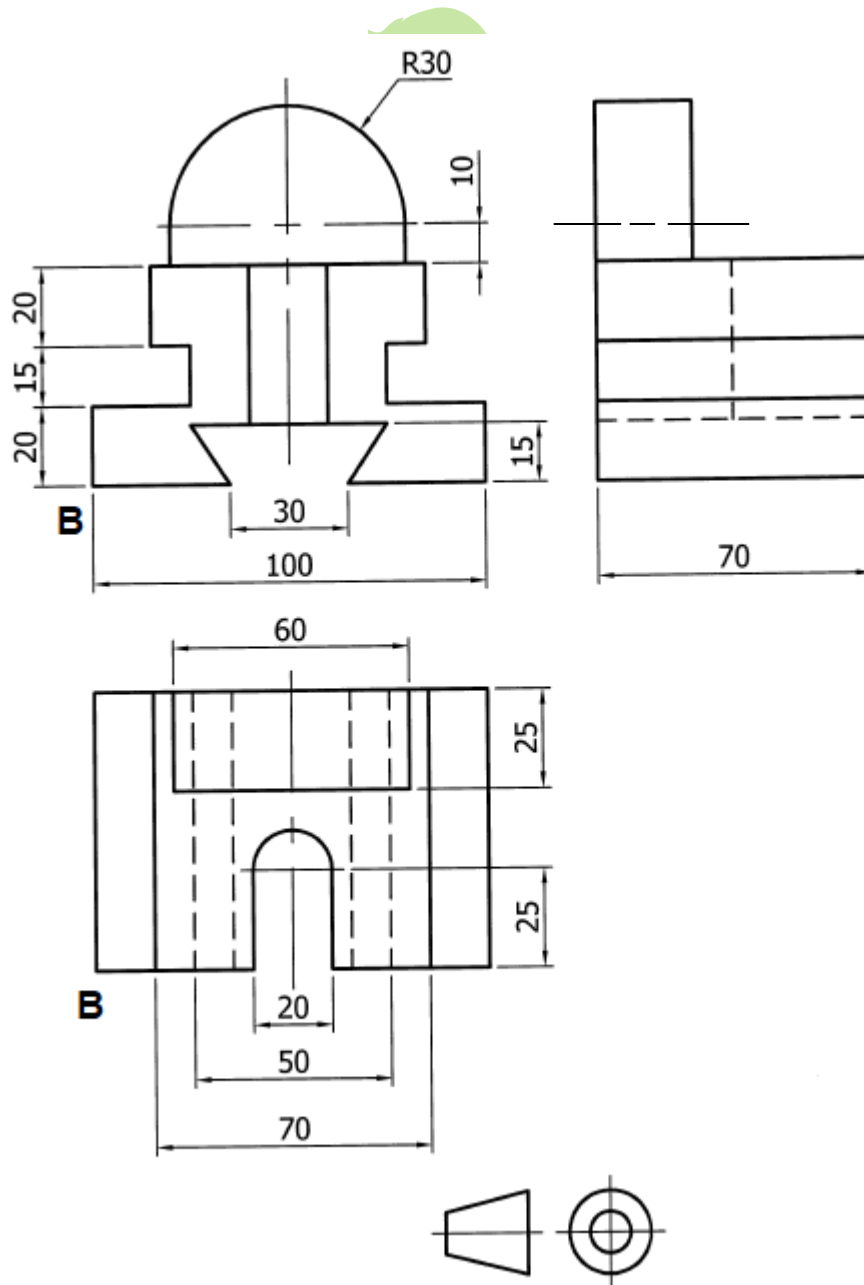
**QUESTION 5: ISOMETRIC PROJECTION**

FIGURE 5 shows the primary views of a geometric model.

Construct an isometric scale and draw an isometric projection of the model.

Point B must be the lowest point on the drawing.

NO hidden detail is necessary.

**FIGURE 5****[15]****TOTAL: 100**