higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

NATIONAL CERTIFICATE (VOCATIONAL)

DRAWING OFFICE PROCEDURES AND TECHNIQUES

(Second paper)

NQF LEVEL 4

(12050724)

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

REQUIREMENTS: A4 drawing sheets

This question paper consists of 6 pages.

551Q1N2222

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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. Answer QUESTION 1 in the ANSWER BOOK. Answer all other questions on A4 DRAWING SHEETS.
5. Plot each question on a separate A4 DRAWING SHEET.
6. Plot answers on ONE side of each A4 DRAWING SHEET only.
7. Draw a border line around each A4 DRAWING SHEET.
8. Plot all candidate information in the title block.
9. Candidates will be responsible, with suitable supervision, for the printing/plotting of their own drawings.
10. Maintain a balanced layout. Candidates will be penalised for poor planning.
11. Write neatly and legibly.

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QUESTION 1: 3D MODELING WORKSPACE

1.1 Explain the Cartesian coordinate system used in 3D modelling. (4)

1.2 What are *primitives* in 3D modelling? (2)

1.3 Name any FOUR most commonly used toolbars in a CAD window. (4)

1.4 Explain how to navigate in a 3D model. (3)

1.5 Explain the navigation bar in 3D CAD drawing. (2)

[15]

QUESTION 2: 3D FUNCTIONS AND TOOLS

FIGURE 1 shows three primary views in first-angle orthographic projection of a V-block used in marking off in engineering.

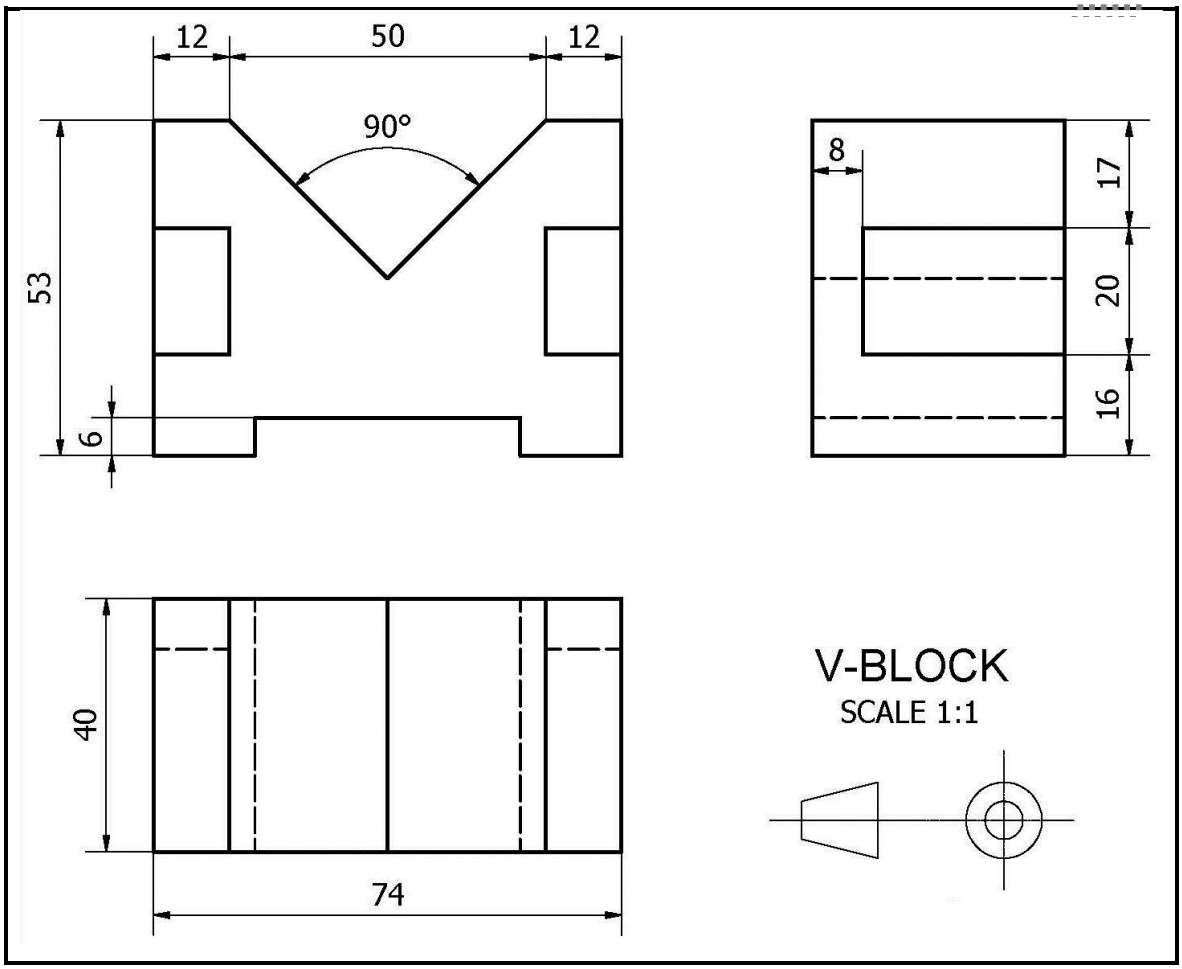


FIGURE 1

2.1 Use a CAD software program to draw, to scale 1:1, the THREE views of the V-block in first-angle orthographic projection. (12)

2.2 Produce a 3D drawing view using a CAD software program. (7)

2.3 Include all dimensions on the drawing. (2)

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2.4 Include a title bar with student number, centre number, scale, date, and question number. (2)

2.5 Plot the drawing and candidate information on an A4 DRAWING SHEET. (2)

[25]

QUESTION 3: SECTION A MODEL AND CREATE DRAWINGS

FIGURE 2 shows two primary views of a clutch component in third-angle orthographic projection.

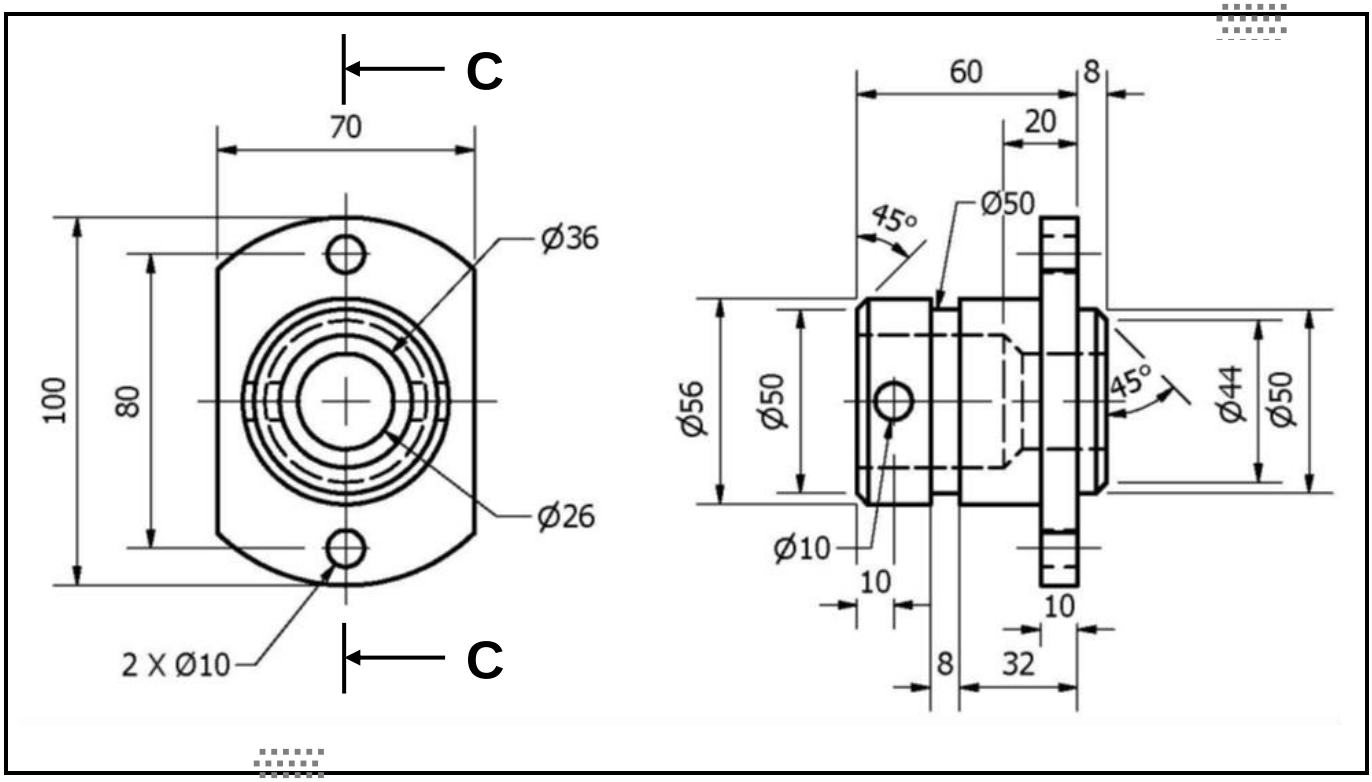


FIGURE 2

3.1 Use a CAD software program to draw, to scale 1:1, the given front and right views of the clutch component in third-angle orthographic projection. (10)

3.2 Create a section-rendered drawing on cutting plane C-C. Insert it below the orthographic views. (10)

3.3 Include all dimensions on the front and top views. Do not insert dimensions on the rendered sectional view. (5)

3.4 Include a title bar with student number, centre number, scale, date and question number. (2)

3.5 Plot the drawing and candidate information on a portrait-oriented A4 DRAWING SHEET. (2)

3.6 Insert the correct orthographic projection symbol. (1)

[30]

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QUESTION 4: APPLY VISUALISATION TOOLS TO ENHANCE 3D DRAWINGS

FIGURE 3 shows an isometric view of a support plate.

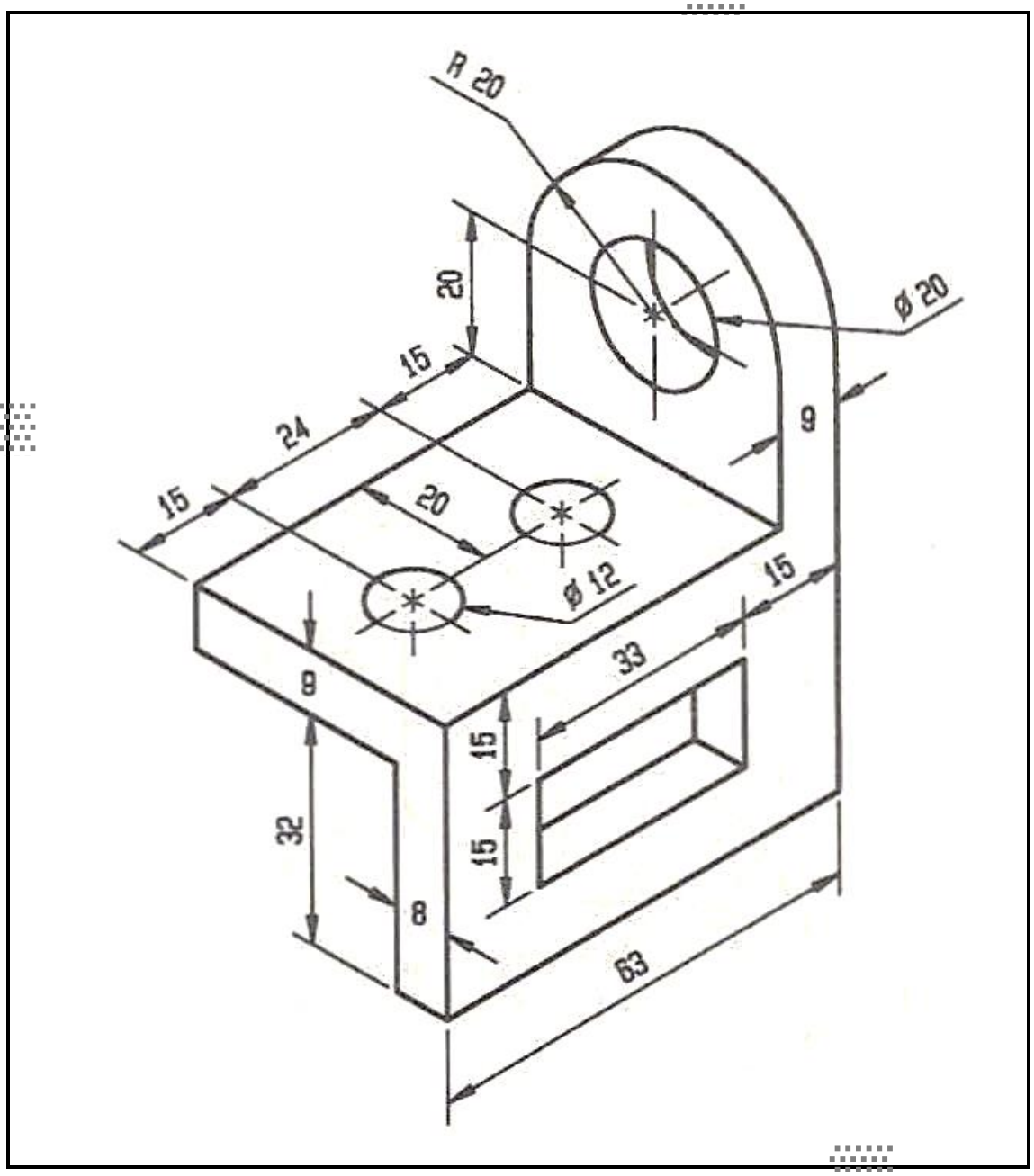


FIGURE 3

4.1 Use a CAD software program to draw, to scale 1:1, the following THREE views of the support plate in first-angle orthographic projection on a landscape-oriented A4 DRAWING SHEET:

4.1.1 A front view

4.1.2 A top view

4.1.3 A left view

(3 × 4) (12)

4.2	Draw a 3D model from the three views and insert it below the drawn views.	(6)
4.3	Add lighting and materials and render as an isometric view.	(8)
4.4	Include a title bar with student number, centre number, scale, date and question number.	(2)
4.5	Plot the drawing and candidate information on an A4 DRAWING SHEET.	(2)
		[30]

TOTAL: 100

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