

073206T4CEN

CIVIL ENGINEERING LEVEL 6

CON/OS/CET/CC/02/6

Prepare and Interpret Technical Drawings

November/December 2025



**TVET CURRICULUM DEVELOPMENT, ASSESSMENT AND CERTIFICATION
COUNCIL (TVET CDACC)**

WRITTEN ASSESSMENT

Time: 3 HOURS

INSTRUCTIONS TO CANDIDATE

1. This paper consists of **TWO** sections: **A** and **B**.
2. Answer **ALL** questions in section A and **ANY THREE** (3) questions in section B.
3. Marks for each question are indicated in the brackets.
4. Candidates are provided with a separate answer booklet
5. Do not write on the question paper.

This paper consists of SIX (6) printed pages.

Candidates should check the question paper to ascertain that all pages are printed as indicated and that no questions are missing.

SECTION A (40 MARKS)

Answer ALL the questions in this section.

1. Tolerances in technical drawing specify the allowable variation in the dimensions of a part. State TWO importance of tolerances in technical drawing. (2 Marks)
2. Different types of lines such as object lines, extension lines, section lines and break lines play vital role in technical drawing as they have different uses. Explain the use of the following lines in technical drawing:
 - i. object lines (1 Mark)
 - ii. section lines (1 Mark)
 - iii. break lines. (1 Mark)
3. In technical drawing, proper care of drawing tools and equipment ensures accuracy and durability. State FOUR reasons for maintaining drawing tools and equipment. (4 Marks)
4. In technical drawing the title block lies within the drawing space at the bottom of the sheet or at the bottom right-hand corner of the sheet with a maximum length of 185 mm and width of 65 mm. List FIVE items that should be included in the title block. (5 Marks)
5. Different types of scales such as Diagonal scale, Comparative scale and scale of chords are used to prepare a drawing on a reduced scale so that large object can be accommodated on the limited size of drawing sheet. Sketch the following scales:
 - i. diagonal scale (2 Marks)
 - ii. comparative scale (2 Marks)
 - iii. scale of chords. (2 Marks)
6. A parabola and a hyperbola are types of conic sections that are formed when a cone is cut by a plane. Draw a parabola using tangent method with 70mm as base and 30mm as the length of the axis. (5 Marks)
7. Technical drawings are an essential communication tool in civil engineering projects, as they translate design concepts into precise construction details. State FOUR importance of technical drawing in civil engineering. (4 Marks)
8. Solid models and Wire –frame models are examples of CAD software that improve record keeping through better documentation and communication as well as improved efficiency in the quality of design. Describe the following CAD software models:
 - i. solid models (2 Marks)
 - ii. wire-frame models (2 Marks)
9. One of the most widely used methods is orthographic projection, which presents multiple views of an object. Define orthographic projection in technical drawing. (3 Marks)

10. Extension lines and dimension lines are two key elements used in technical drawings to indicate the size and location of features. Differentiate between extension lines and dimension lines. (4 Marks)

SECTION B (60 MARKS)

Answer THREE Questions in This Section

11. The study of plane geometry in technical drawing is useful for a civil engineer as it forms the foundation for many essential tasks in the field.
- Explain the importance of plane geometry to a civil engineer in the following fields
 - Surveying and Mapping: (3 Marks)
 - Design and Planning: (4 Marks)
 - Construction and Execution: (2 Marks)
 - Draw the following angles using a pair of compasses and a ruler only
 - 82.5 degrees (3 Marks)
 - 97.5 degrees (3 Marks)
 - Construct a triangle whose vertical angle is 45 degrees, altitude is 40mm and perimeter 170 mm. (5 Marks)
12. Figure 1 shows orthographic views of a machine block, drawn in third angle projection. Draw the isometric projection of the block. (20 Marks)

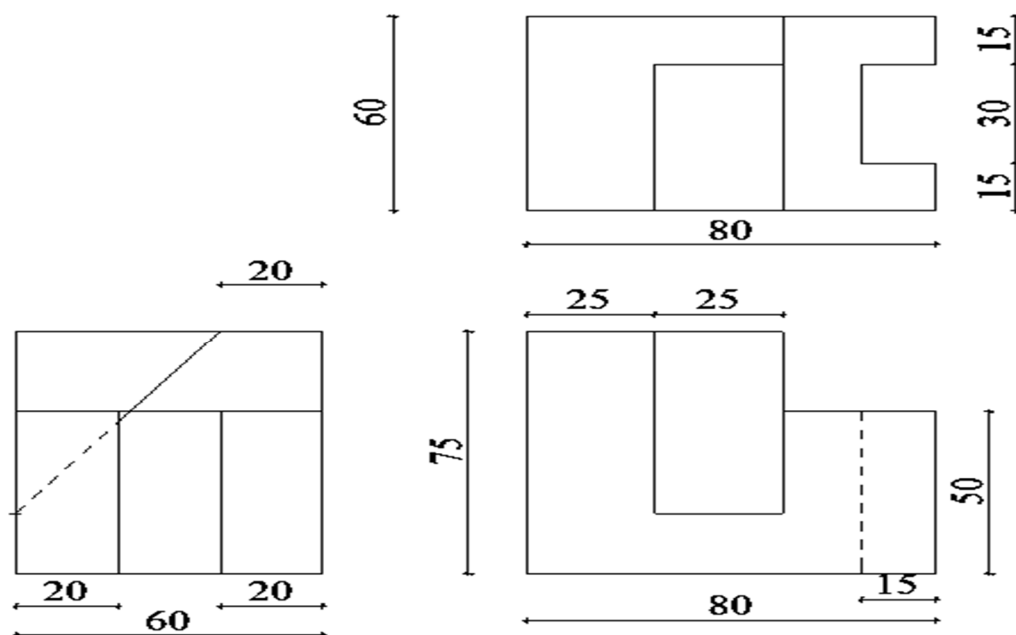
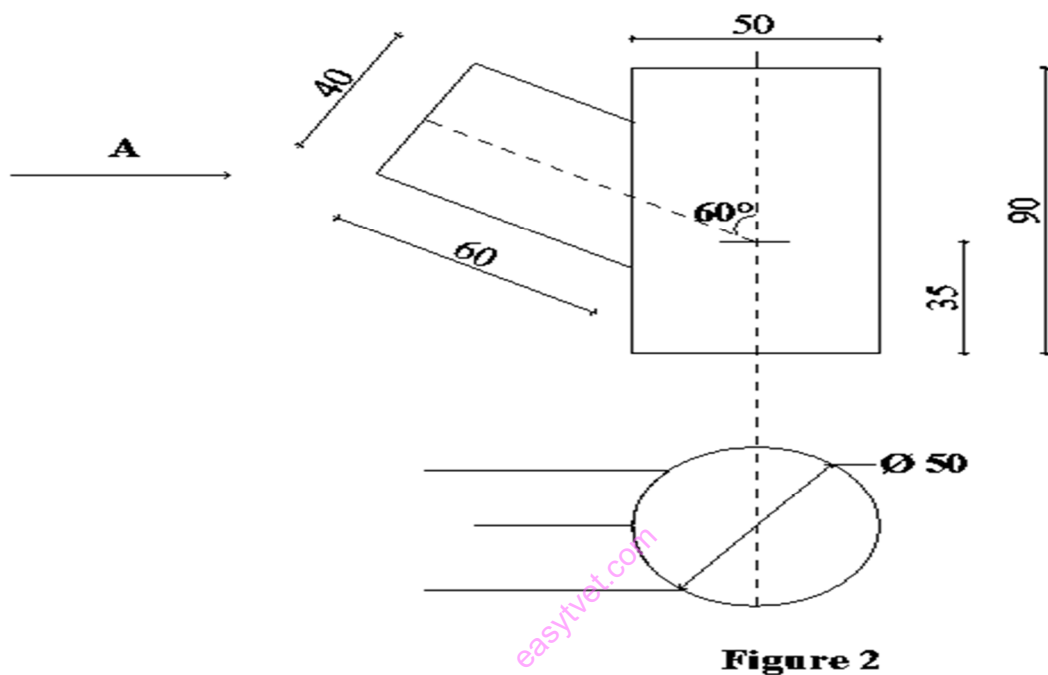


Figure 1

13. Figure 2 shows two views of offset cylinders angled at 60° .

- Re-draw the plan and the front view (elevation). (5 Marks)
- Construct the curve of intersection between the two cylinders. (5 Marks)
- Complete the plan view. (5 Marks)
- Draw the end view in the direction of arrow A, showing hidden details. (5 Marks)



14. Figure 3 shows the isometric view of a machine block. Taking arrow X as the front view, draw in First angle orthographic projection the.

- Front elevation. (8 Marks)
- End elevation. (7 Marks)
- Plan. (5 Marks)

