



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

Qualification Code : 071606T4MCT
Qualification : Mechatronics Technician Level 6
Unit Code : ENG/OS/MC/CC/01/6
Unit of Competency : Prepare and Interpret Technical Drawing

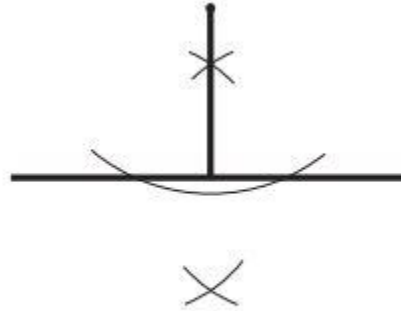
WRITTEN ASSESSMENT ASSESSOR'S GUIDE

INSTRUCTIONS TO ASSESSOR:

1. The candidate has **THREE HOURS** to attempt all the questions.
2. Marks for each section are indicated in the brackets
3. The paper consists of **TWO** sections: **A** and **B**.
4. The candidate is required to attempt **ALL** questions from section **A** and **ANY THREE** questions from section **B**.
5. The candidate is provided with answer booklet for their responses.

SECTION A: (40 MARKS)

1. Using a ruler and a pair of compass only, construct a perpendicular line from a point (2 marks)



To erect a perpendicular from a point to a line.

(Award 1 mark for the arcs and 1 marks for the correct drawing)

2. Using a ruler and a pair of compass only, construct 60° (2 marks)



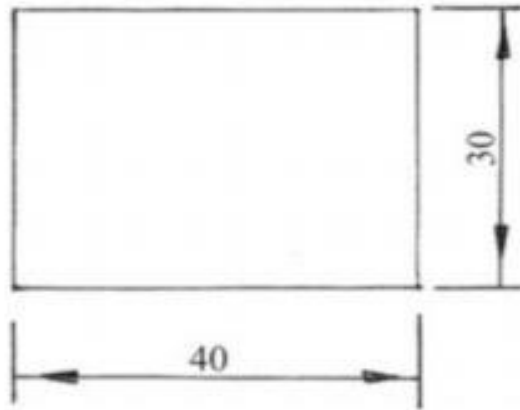
To construct 60° .

(Award 1 mark for the arcs and 1 marks for the correct drawing)

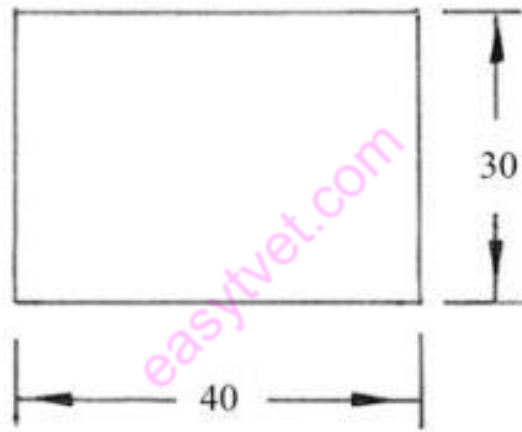
3. Define the following terms (4 marks)
- A scalene triangle- ***it is a triangle with three unequal sides and three unequal angles.***
 - An isosceles triangle- ***it is a triangle with two sides, and hence two angles, equal.***
 - An equilateral triangle- ***it is a triangle with all the sides, and hence all the angles, equal.***
 - A right-angled triangle- ***it is a triangle containing one right angle. The side opposite the right angle is called the 'hypotenuse'.***

(Award 1 mark for each correct definition)

4. Illustrate using diagrams the difference between aligned and unidirectional system dimensioning (4 marks)



Aligned system



Unidirectional system

(Award 2 mark for each correct response)

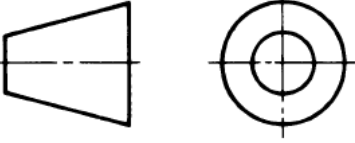
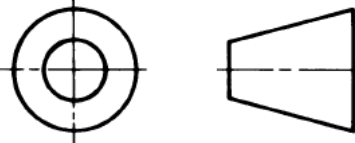
5. Outline four basic tools a draftsman needs during draw

(4 marks)

- i. A range of pencils*
- ii. Ruler*
- iii. Set squares*
- iv. Rubber*
- v. Compasses*
- vi. Dividers*
- vii. Drawing board*
- viii. T-square*

(Award 1 mark for each correct response, any 4)

6. Identify using standard symbols the differences between first angle and third angle of projection (4 marks)

Projection	Symbol
First angle	
Third angle	

(Award 2 mark for each correct symbol of projection)

7. List four types of lines used in drawing and give one purpose for each? (4 Marks)

Line	Purpose
Bold continuous	<i>Visible outlines</i>
Thin continuous	<i>Used in layouts and used as guide lines</i>
Thin short dashes	<i>Used to show hidden details</i>
Bold continuous irregular line	<i>Short break</i>
Bold broken line	<i>Cutting plane / viewing plane</i>

(Award 1 mark for each correct response, any 4)

8. State three information that is contained in the bill of materials used for identification and interpretation of a drawing. (3 marks)
- i. **Part number**
 - ii. **Part name**

- iii. *Material specification*
- iv. *Number of components*

(Award 1 mark for each correct response, any 3)

9. Outline the steps of constructing the circumference of a circle, given the diameter (4 marks)
- i. *Draw a semi-circle of the given diameter AB, centre O.*
 - ii. *From B mark off three times the diameter, BC.*
 - iii. *From O draw a line at 30° to OA to meet the semi-circle in D.*
 - iv. *From D draw a line perpendicular to OA to meet OA in E and join EC*

(Award 1 mark for each correct response, any 4)

10. State two features of oblique projection (2 marks)
- i. *Sloping lines are drawn to half their true size*
 - ii. *Sloping lines are drawn at 45°*

Award 1 mark for each correct response, any 2)

11. Outline three classification of oblique projections (3 marks)
- i. *Cavalier*
 - ii. *Cabinet*
 - iii. *general*

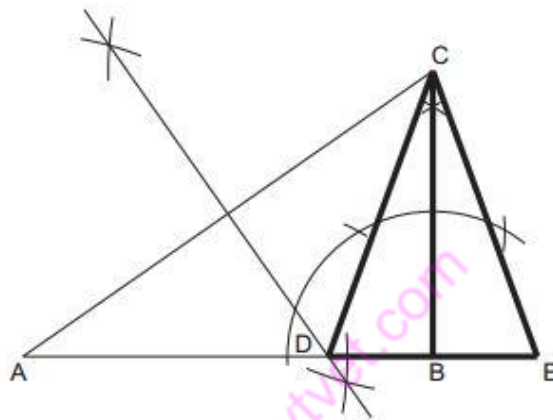
(Award 1 mark for each correct response, any 3)

12. List four types of section views in technical drawing (4 marks)
- i. *Full sections*
 - ii. *Half sections*
 - iii. *Offset sections*
 - iv. *Revolved sections*
 - v. *Removed sections*
 - vi. *Broken-out sections*

(Award 1 mark for each correct response, any 4)

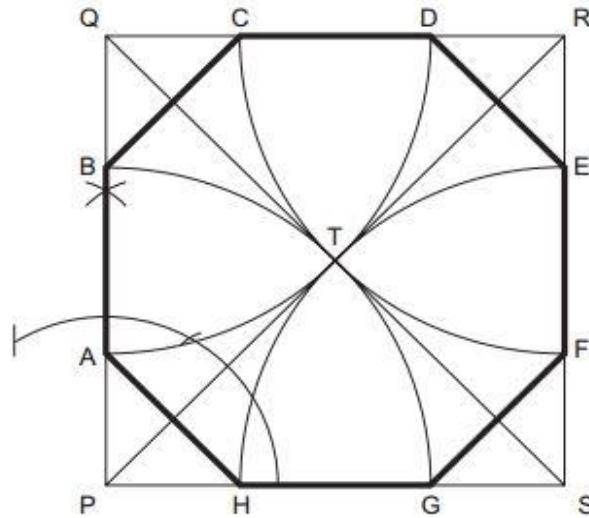
SECTION B: (60 MARKS)

- 13.
- a. Describe the procedure and construct an isosceles triangle given the perimeter and the altitude (10 marks)
- Draw line AB equal to half the perimeter.*
 - From B erect a perpendicular and make BC equal to the altitude.*
 - Join AC and bisect it to cut AB in D.*
 - Produce DB so that BE=BD. CDE is the required triangle.*



(Award 4 marks for the correct steps listed (correct order is key), 4 marks for the well-drawn triangle and 2 marks for neatness and correct use of pencils)

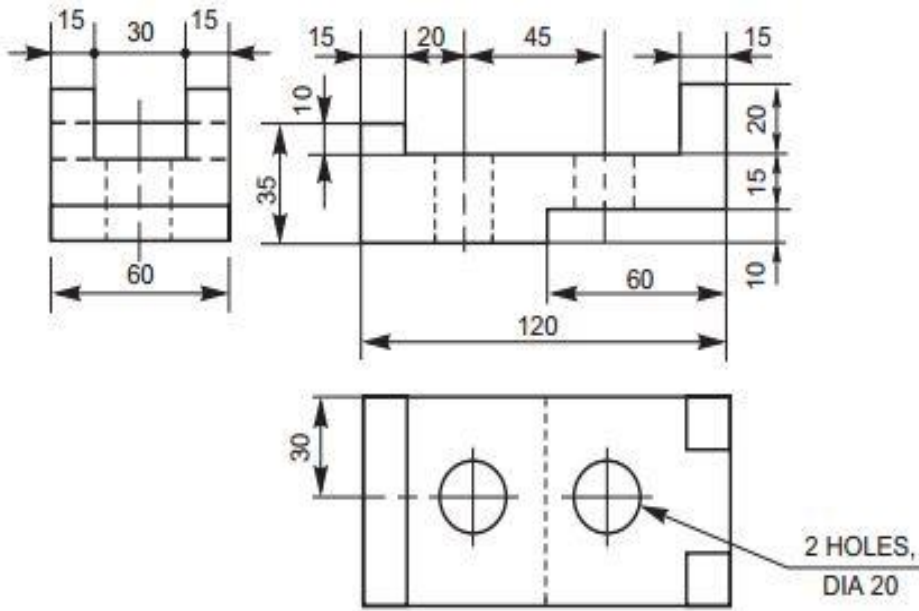
- b. Describe the procedure and construct a regular octagon within a given square (10 marks)
- Construct a square PQRS, length of side equal to the diameter.*
 - Draw the diagonals SQ and PR to intersect in T.*
 - With centers P, Q, R and S draw four arcs, radius PT (=QT, =RT, =ST) to cut the square in A, B, C, D, E, F, G and H.*



(Award 3 marks for the correct steps listed (correct order is key), 5 marks for the well-drawn octagon and 2 marks for neatness)

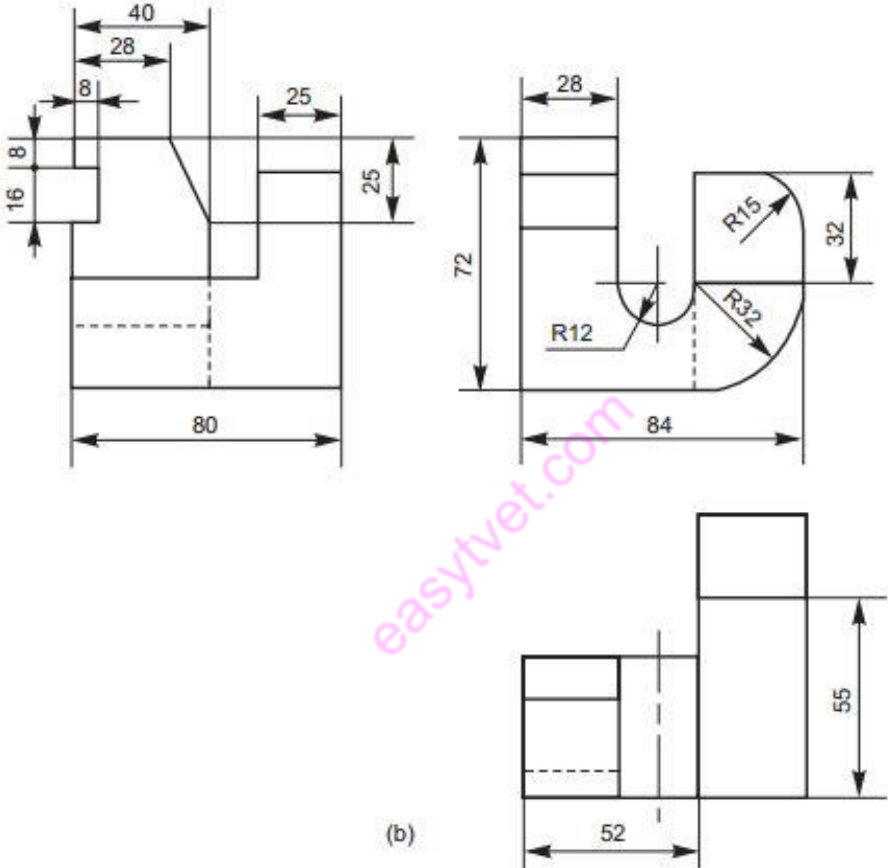
14. On A3 size drawing paper, using drawing instruments draw in first angle projection the views of the block given in figure below as follows: (20 marks)
- Front elevation in the direction of arrow E;
 - End elevation in the direction of arrow H;
 - Plan.

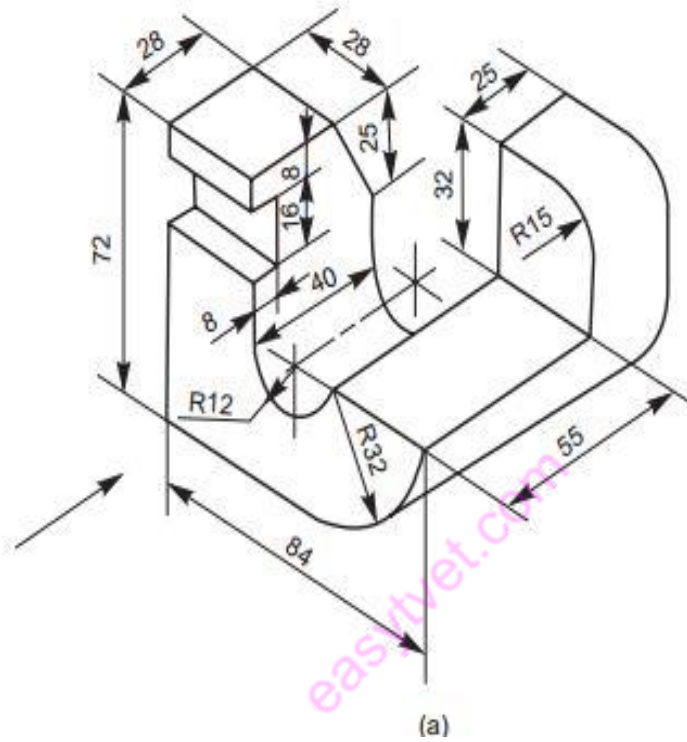
The arrow indicates the front view



(Award 4 marks for each view that is accurately drawn, 4 marks for correct dimensioning, 3 marks for title block and 1 mark for neatness. The angle of projection should be correct.)

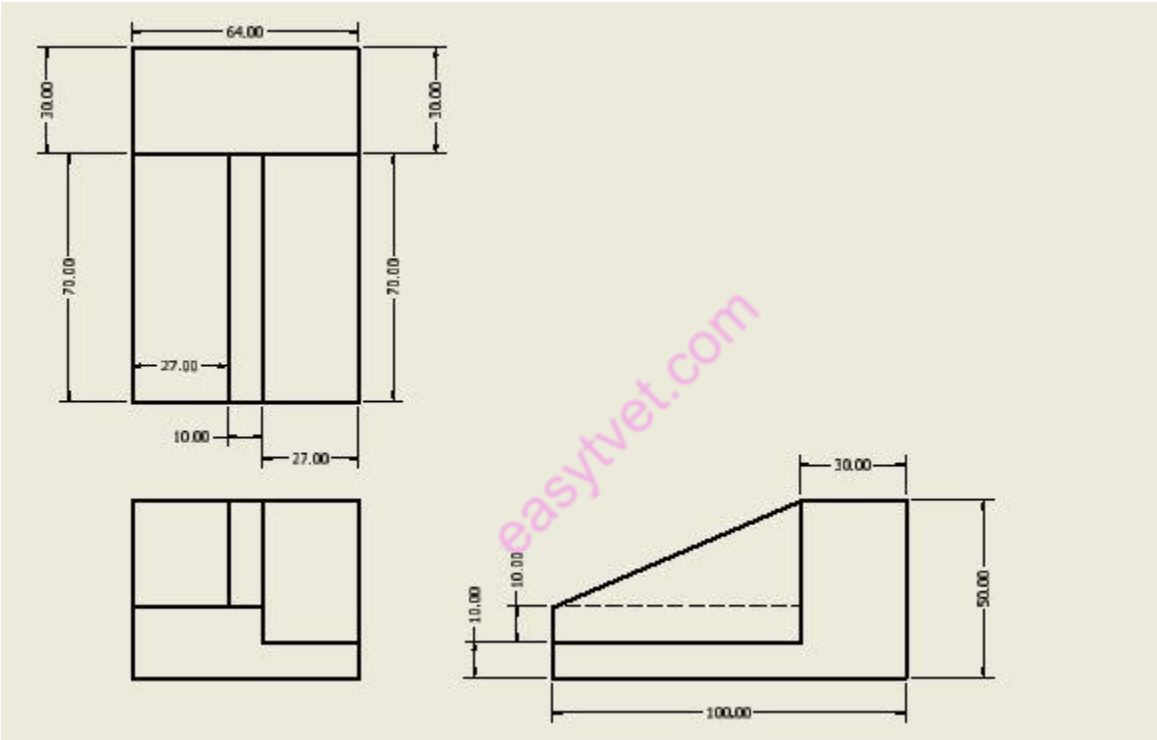
15. The figure below shows the three views of a shaped block. On A3 size drawing paper and using drawing instruments draw the block in oblique and give 5 major dimensions. (20 marks)

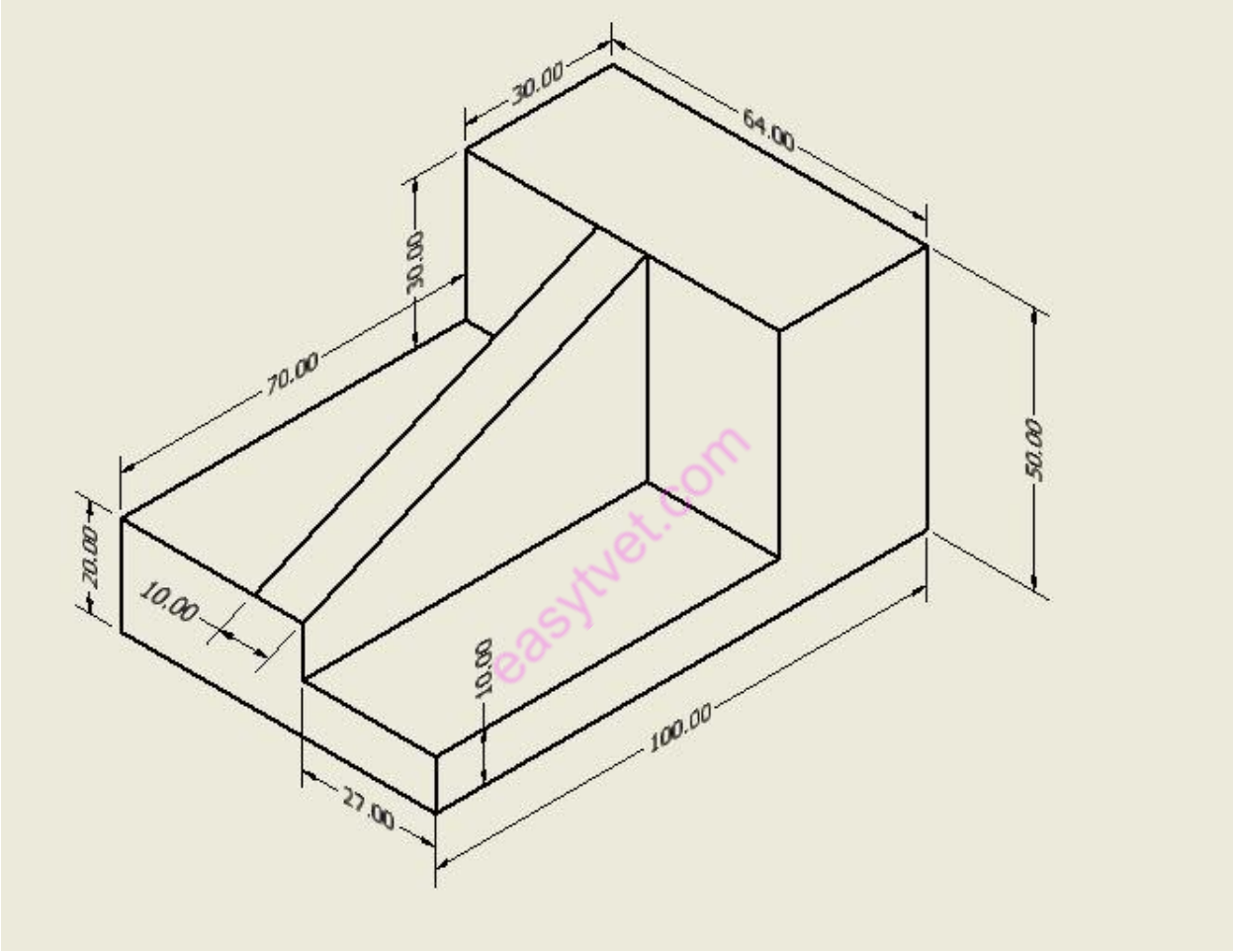




(Award 10 marks for the accurately drawn figure, 5 marks for correct dimensioning, 3 marks for title block and 2 marks for neatness and correct use of pencils)

16. The figure below shows the three views of a shaped block. On A3 size drawing paper and using drawing instruments draw the block in isometric projection and give 5 major dimensions. (20 marks)





(Award 10 marks for the accurately drawn figure, 5 marks for correct dimensioning, 3 marks for title block and 2 marks for neatness and correct use of pencils)