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TECHNICAL DRAWING
Oct./Nov. 2021
Time: 3 hours



THE KENYA NATIONAL EXAMINATIONS COUNCIL

**CRAFT CERTIFICATE IN CARPENTRY AND JOINERY
CRAFT CERTIFICATE IN MASONRY
CRAFT CERTIFICATE IN PLUMBING**

TECHNICAL DRAWING

3 hours

INSTRUCTIONS TO CANDIDATES

You should have the following for this examination:

Answer booklet;

Drawing paper size A₂;

Drawing instruments;

A scientific calculator.

Answer FIVE questions of the following EIGHT questions.

All questions carry equal marks.

Maximum marks for each part of a question are indicated.




All dimensions are in millimeters.

Candidates should answer the questions in English.

This paper consists of 9 printed pages.

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

1. (a) Draw the following lines used in technical drawing and print their names between guidelines of 5 mm.

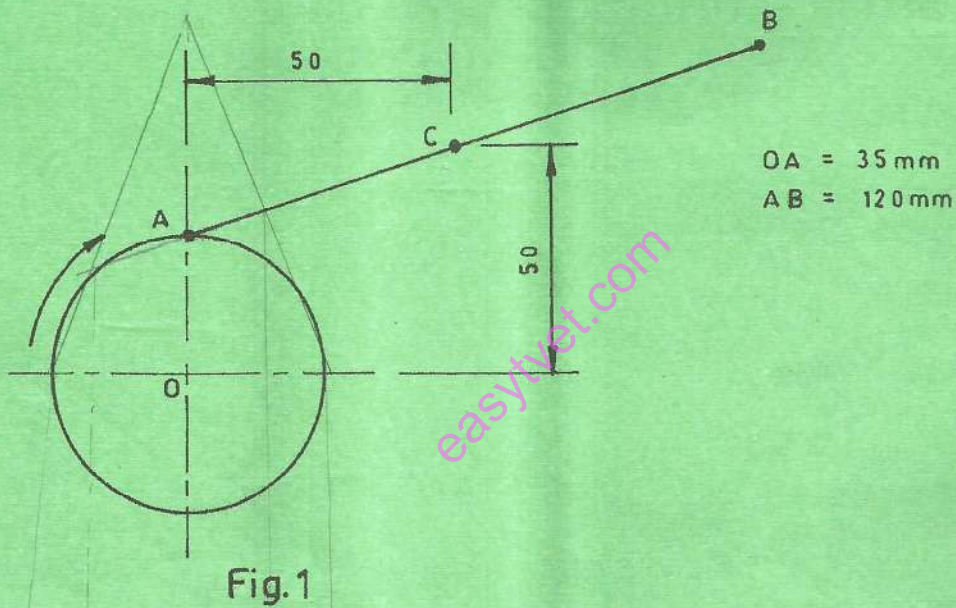
- (i) centre line; 
- (ii) leader line; 
- (iii) hidden details; 
- (iv) outline.

(6 marks)

(b) Using universal method, construct a regular heptagon in a circle of diameter 80 mm.

(6 marks)

(c) **Figure 1** shows a mechanism in which crank OA rotates about centre O and the connecting rod AB slides through the fixed centre C. Draw the locus of point B for one revolution of the crank. (8 marks)



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2. (a) Construct an ellipse within two concentric circles given the diameters of 100 mm and 60 mm respectively. (6 marks)
- (b) **Figure 2** shows an isometric drawing of a shaped block. Using first angle orthographic projection, draw:
- (i) the front elevation;
 - (ii) the end elevation;
 - (iii) the plan.

(14 marks)

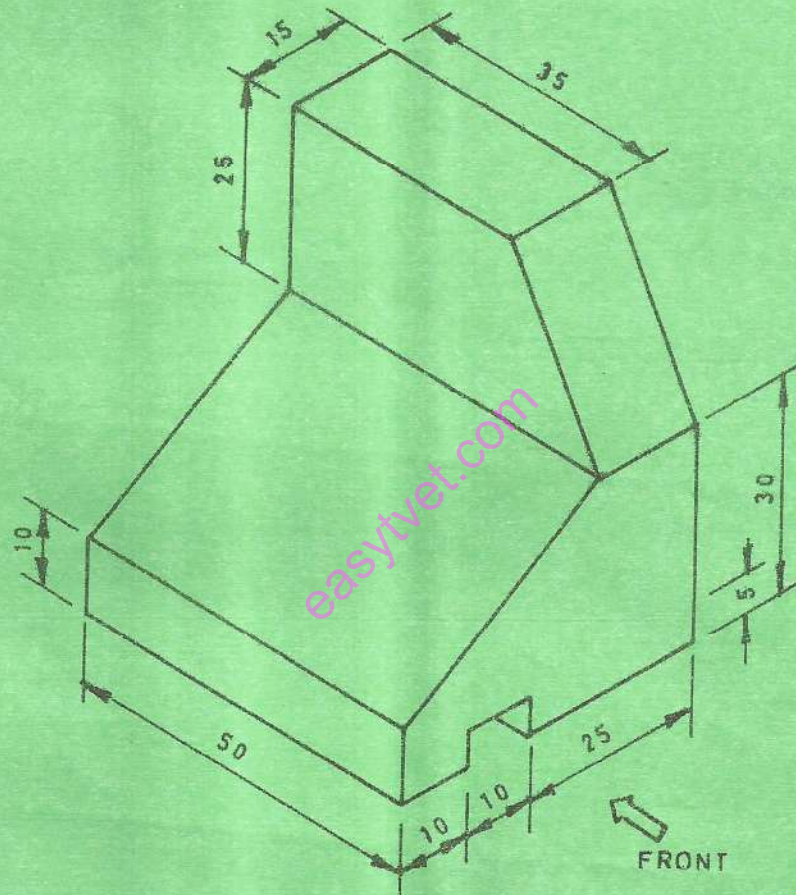
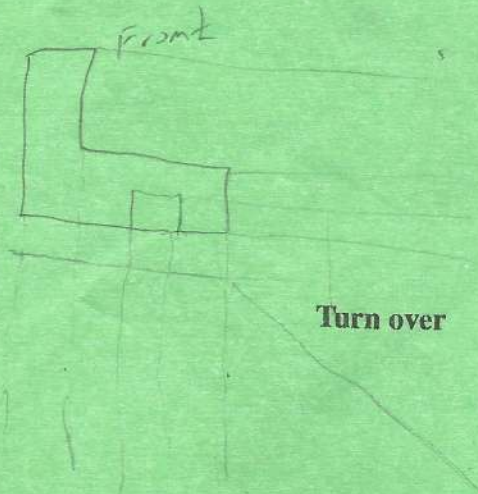
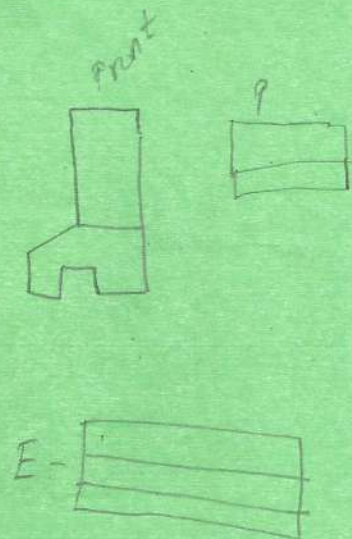


Fig.2



3. **Figure 3** shows a pictorial view of a block. Use the given layout to draw the block in two points perspective. (20 marks)

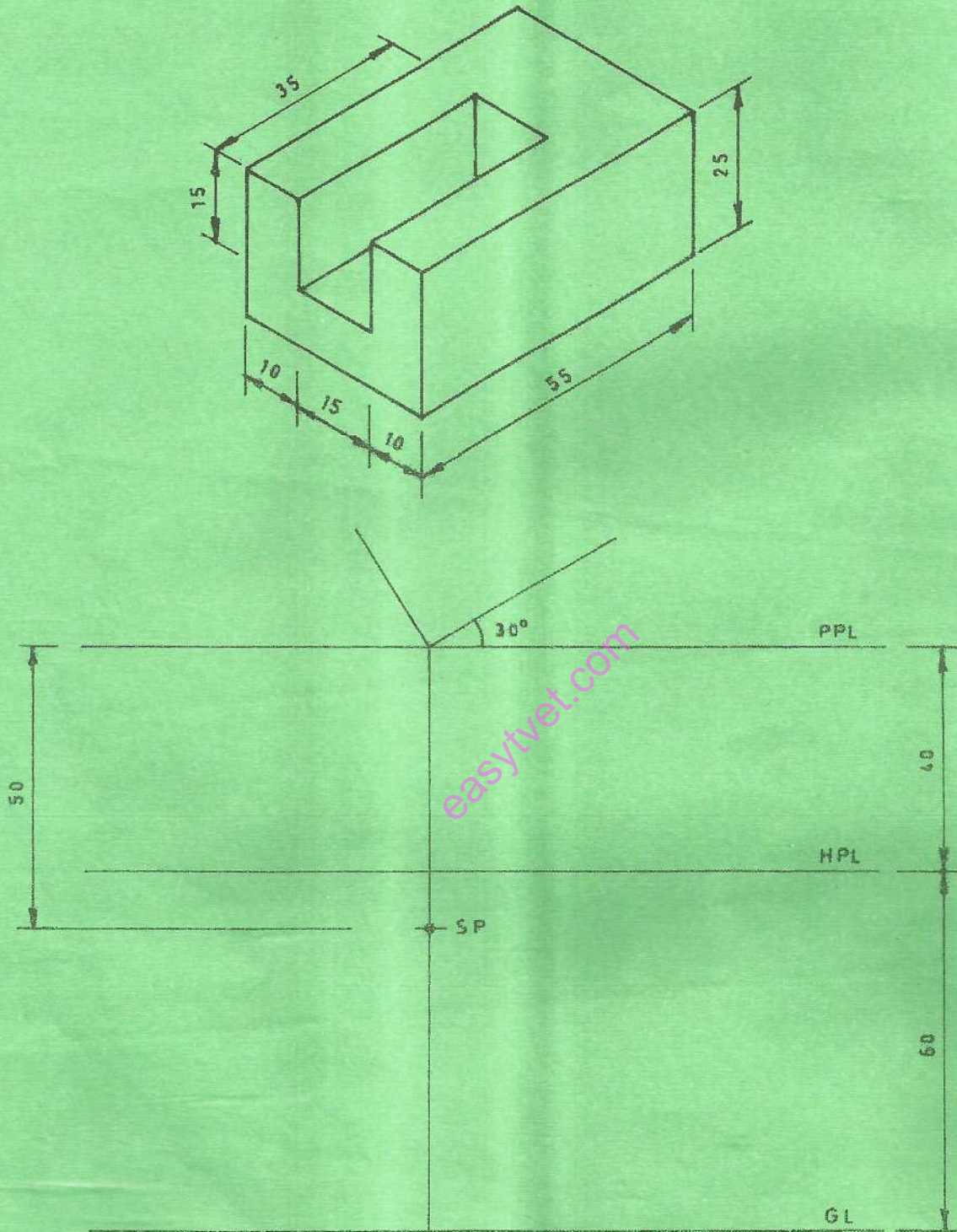


Fig. 3

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4. (a) **Figure 4** shows an elevation and a plan of a cylinder with a diameter of 50 mm and a height of 100 mm. Construct a cylindrical helix given the lead = 70 mm. (8 marks)

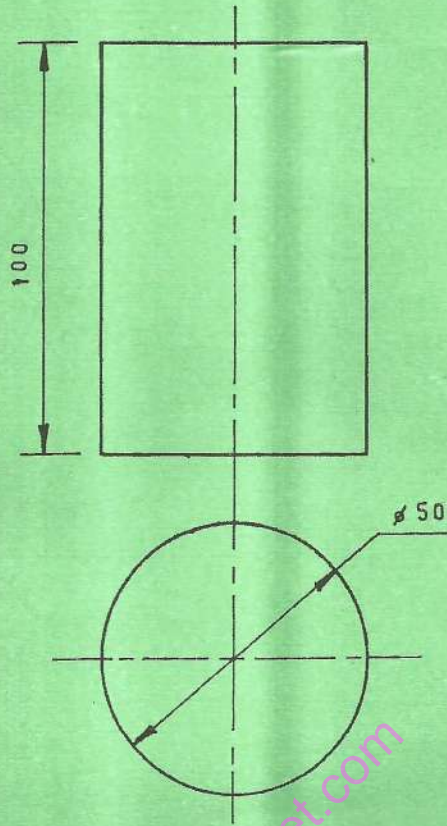


Fig. 4

- (b) **Figure 5** shows an outline of three pulley wheel connected by a taut belt. To a scale of 1:1, draw the figure clearly showing the constructions for obtaining the points of contact of the belt and pulleys. (12 marks)

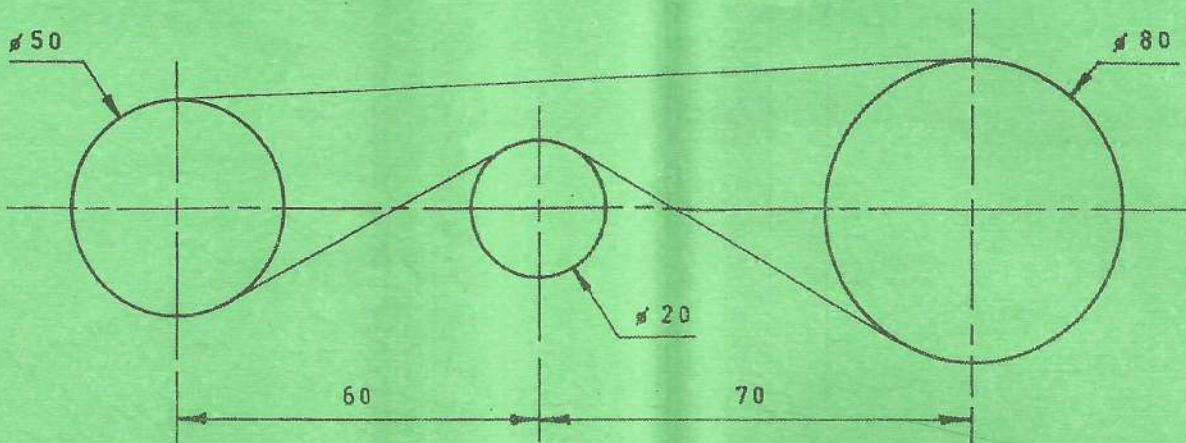


Fig.5

5. **Figure 6** shows an elevation of a truncated hexagonal pyramid. Draw:

- (i) the given elevation;
- (ii) the plan;
- (iii) left end elevation;
- (iv) true shape of the cut surface.

(20 marks)

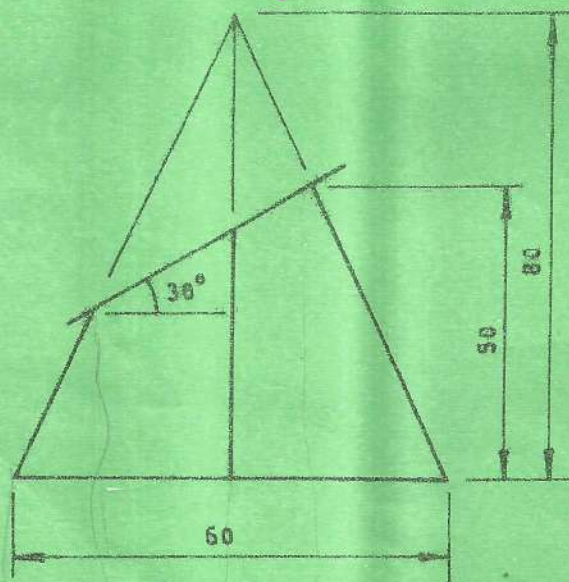


Fig. 6

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6. (a) A rectangle has a length of 75 mm and a breadth of 40 mm. Construct a triangle equal in area to the rectangle. (5 marks)
- (b) Figure 7 shows an orthographic projection of a block. Draw the pictorial view of the block in oblique cavalier. (15 marks)

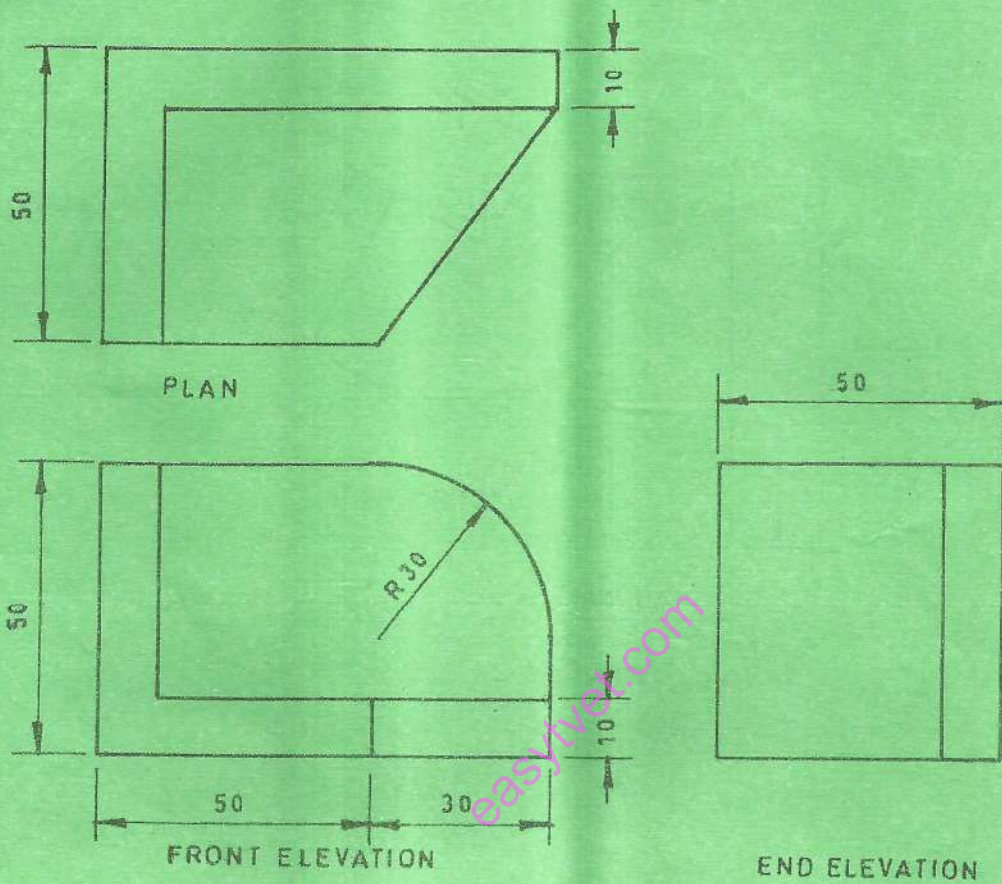
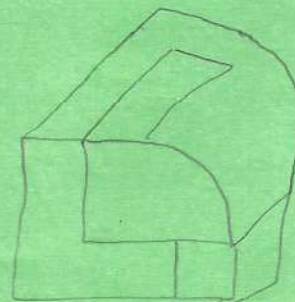


Fig.7



7. **Figure 8** shows a front elevation of a square pipe intersected by a circular pipe. Copy the given view and draw:

- (i) the plan;
- (ii) curve of interpenetration;
- (iii) development of circular pipe.

(20 marks)

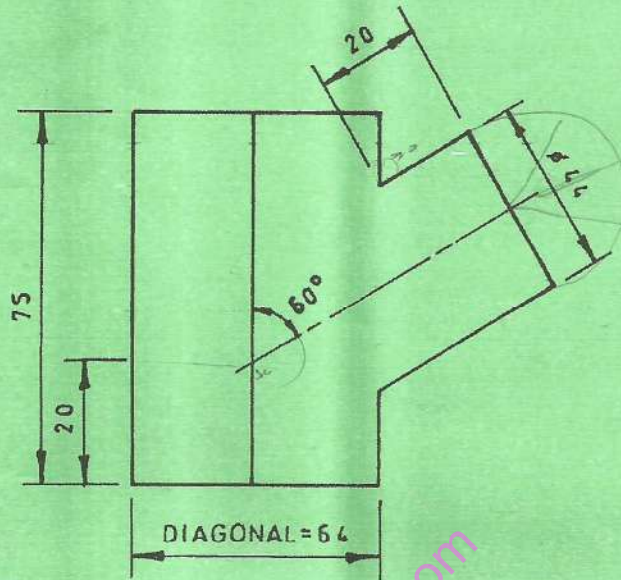


Fig. 8

8. (a) Using freehand, sketch pictorial views of any **three** of the following hand tools:

- (i) cold chisel;
- (ii) marking gauge;
- (iii) ball peen hammer;
- (iv) wooden float.

(9 marks)

(b) To a scale of 1:10, draw a cross-section showing closed eave details of a pitched roof given the following specifications:

Rafter	-	100 x 50 mm
Purlin	-	75 x 50 mm
Tie beam	-	100 x 50 mm
Wall plate	-	75 x 50 mm
Fascia board	-	200 x 25 mm
Half round gutter	-	150 mm diameter
Roof covering	-	30 G GCI Sheets
Roof pitch	-	30°

Assume any other relevant information not provided.

(11 marks)

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