

1308/312
SURVEY DRAWING
June/July 2020
Time: 3 hours



THE KENYA NATIONAL EXAMINATIONS COUNCIL
CRAFT CERTIFICATE IN LAND SURVEYING

SURVEY DRAWING

3 hours

INSTRUCTIONS TO CANDIDATES

You should have the following for this examination:

- Answer booklet;*
- Drawing paper;*
- Drawing instruments;*
- Scientific calculator.*

This paper consists of EIGHT questions in TWO sections A and B.

Answer FIVE questions choosing at least TWO questions from each section.

Maximum marks for each part of a question are as shown.

Candidates should answer the questions in English.

This paper consists of 8 printed pages.

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

SECTION A: TECHNICAL DRAWING

Answer at least *TWO* questions from this section.

1. (a) **Figure 1** shows a square prism 20 mm sides, intersecting with another square prism of sides 30 mm.
Draw the three orthographic views of the prisms in 3rd angle projection.

(10 marks)

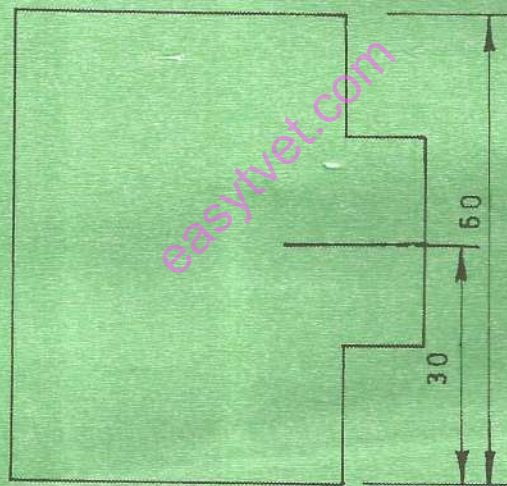
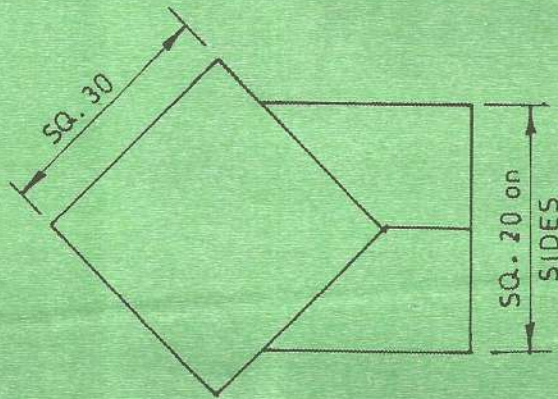


Fig.1

- (b) **Figure 2** shows orthographic views of a block drawing 3rd angle projection. Using a ruler and a pencil only, make a freehand sketch of the block

(10 marks)

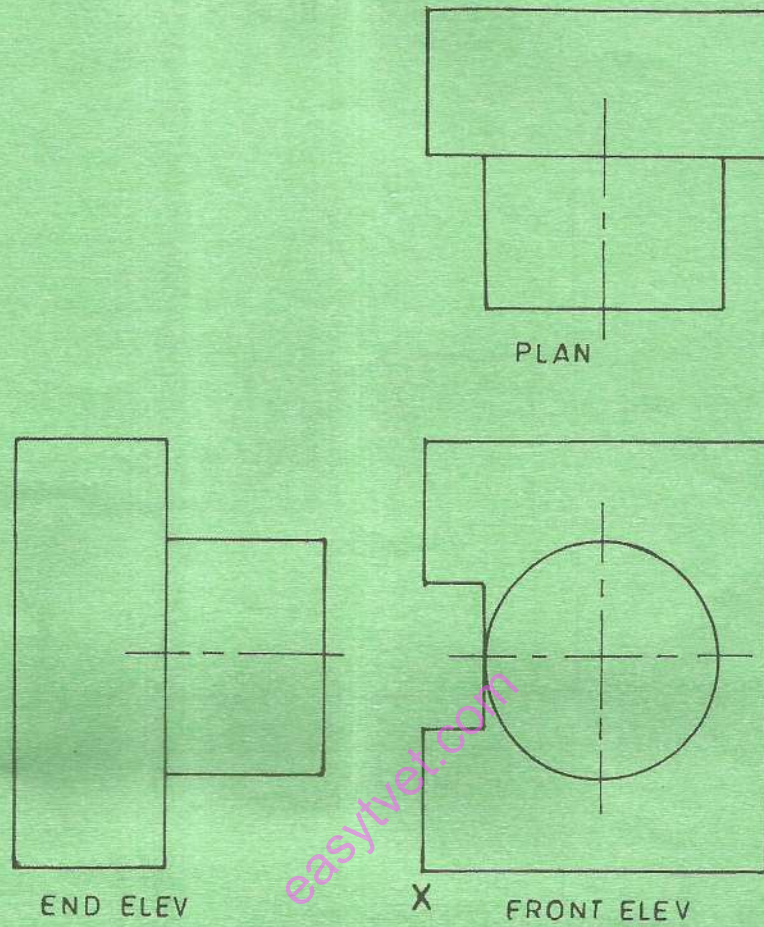


Fig. 2

2. **Figure 3** shows an incomplete plan and incomplete elevation of a cut pyramid. Draw the following:

- (a) Complete plan;
- (b) Complete front elevation;
- (c) True shape of the cut surface;
- (d) Surface development opened along R-R.

(20 marks)

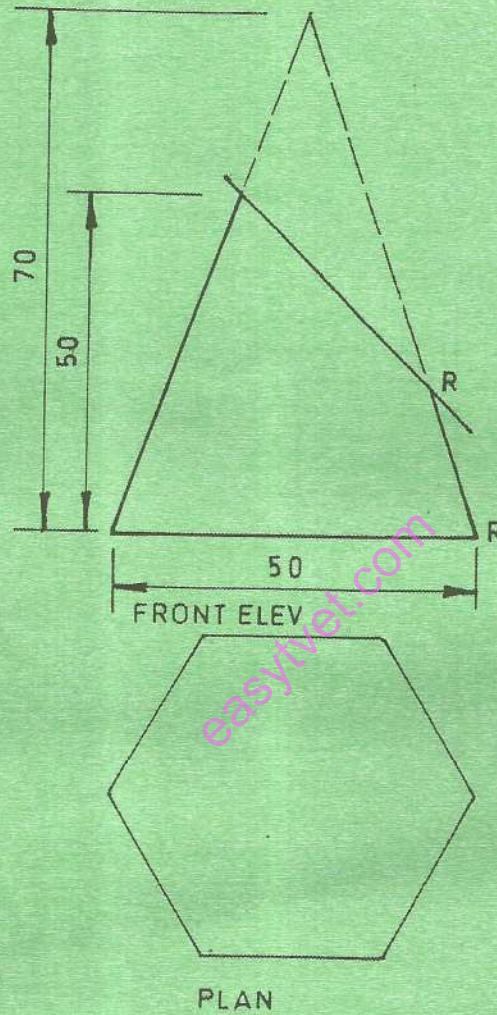
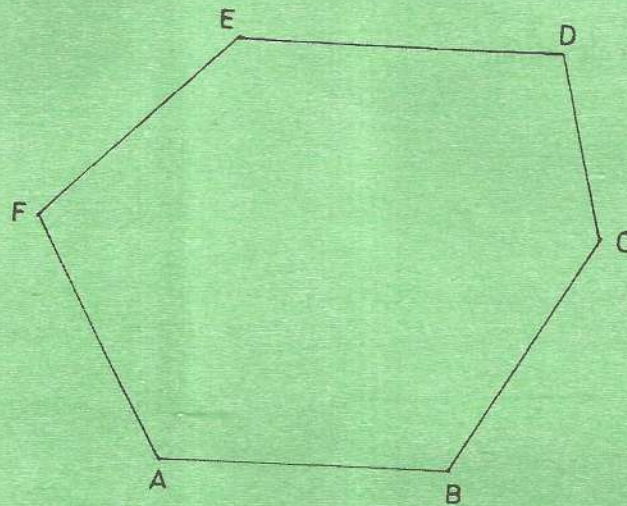


Fig. 3

3. (a) Figure 4 shows an irregular pentagon ABCDEF. Draw the pentagon to a scale of 3:5
(12 marks)



$$\begin{aligned} AB &= 50 \\ FE &= 60 \\ ED &= 50 \\ \angle DEF &= 135^\circ \\ \angle EFA &= 105^\circ \\ \angle FAB &= 120^\circ \end{aligned}$$

Fig. 4

- (b) In a rectangle 40 mm wide draw a diagonal scale, 50 mm = 1 mm, 3 mm long to read 0.01 mm.
(8 marks)

$$\begin{aligned} \text{Height Point A} &= 1640 \text{ m} \\ \text{Point B} &= 1720 \text{ m} \end{aligned}$$

$$\begin{aligned} \text{Difference in length} &= 8 \text{ cm} \\ \text{Scale} &= 1:5000 \end{aligned}$$

$$\text{Gradient} = \frac{\text{height difference}}{\text{horizontal dist}}$$

$$\frac{(1720 - 1640) (100)}{8 - 0}$$

$$= \frac{8000}{8}$$

$$= 1000 \text{ cm}$$

$$\text{Scale} = \frac{1}{5000} \times 1000$$

$$= 0.2 \text{ cm}$$

4. **Figure 5** shows orthographic views of two hexagonal cylinders of different sizes intersecting at an angle of 30° .
Draw the following in first angle projection:

- (a) Complete from elevation;
- (b) Complete plan;
- (c) End elevation.

(20 marks)

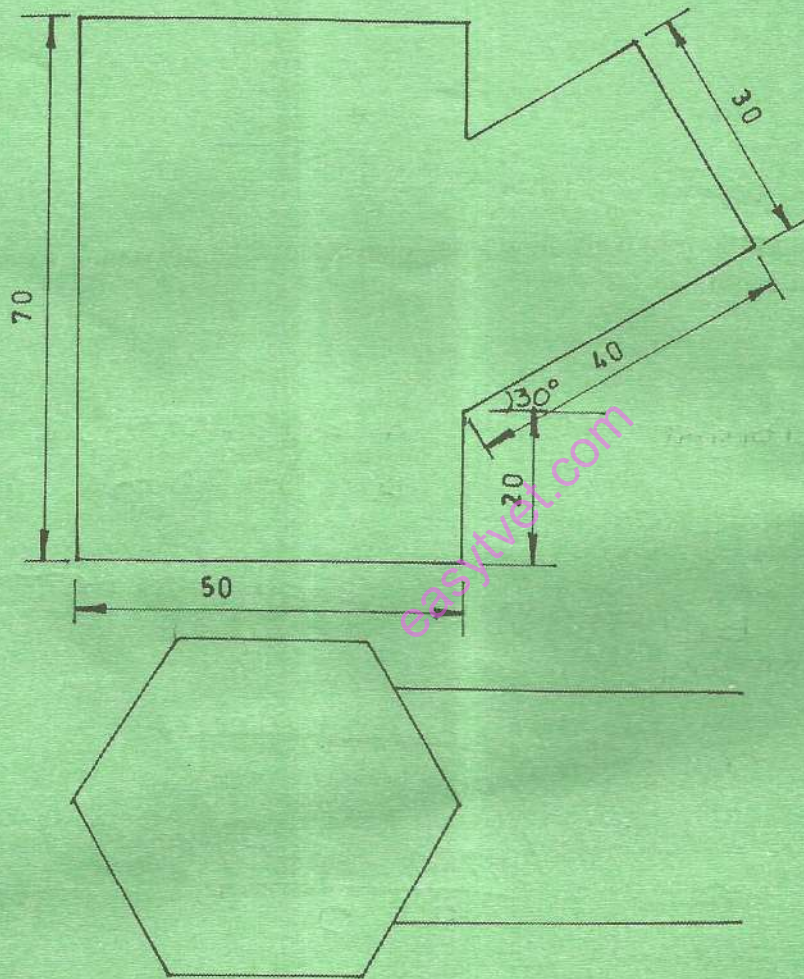


Fig. 5

SECTION B: CARTOGRAPHY

Answer at least **TWO** questions from this section.

5. (a) Outline the following with reference to relief representation:
- (i) intervisibility;
 - (ii) profile;
 - (iii) gradient. (12 marks)
- (b) The heights of two points 'A' and 'B' are 1640 m and 1720 m respectively. The distance between the points is 8 cm and the scale of the map is 1:5000. Calculate the gradient AB. (8 marks)

6. (a) Outline two methods of showing scales on maps and plans giving one example in each case. (4 marks)
- (b) Outline the significance of a diagonal scale. (4 marks)
- (c) From the information given below, construct a diagonal scale and indicate a length of 10.68 m on the scale

Map scale	-	1:250	
Ground distance	-	20 m	
Primary Divisions	-	2 parts	(12 marks)

7. (a) Using illustrations, explain how the following are represented on a survey plan:
- (i) new beacon;
 - (ii) old beacon;
 - (iii) distances;
 - (iv) bearings;
 - (v) property boundaries. (10 marks)
- (b) Using illustrations, estate the characteristics of the following as used in text during mapping:
- (i) point size;
 - (ii) bold face;
 - (iii) type face;
 - (iv) italics;
 - (v) upper case. (10 marks)

8. Use the data in **table 1** to sketch a survey plan of parcel A, B, C, D according to survey regulations assuming the scale of 1:500.

Table 1

STATION	NORTHINGS	EASTINGS
A	-114 467.60	5 597.19
B	-114 444.21	5 670.17
C	-114 507.62	5 647.67
D	-114 498.37	5 683.45

(20 marks)

THIS IS THE LAST PRINTED PAGE.

(a) written statement
 This is scale which is in statement form for example 1cm rep 1km
 Representative fraction
 This is scale in fraction form for example
 $\frac{1}{5000}$

(b) Diagonal scale
 This a graphic which has northings and eastings in a grid drawn to a given scale.