

1704/103
BUILDING CONSTRUCTION I
AND DRAWING
June/July 2022
Time: 3 hours



THE KENYA NATIONAL EXAMINATIONS COUNCIL
CRAFT CERTIFICATE IN BUILDING TECHNOLOGY
MODULE I

BUILDING CONSTRUCTION I AND DRAWING

3 hours

INSTRUCTIONS TO CANDIDATES

You should have the following for this examination

Answer booklet;

Mathematical tables/non programmable scientific calculator;

Drawing instruments;

Size A3 drawing paper.

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

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

All questions carry equal marks.

Maximum marks for each part of a question are indicated.

Candidates should answer the questions in English.

This paper consists of 7 printed pages.

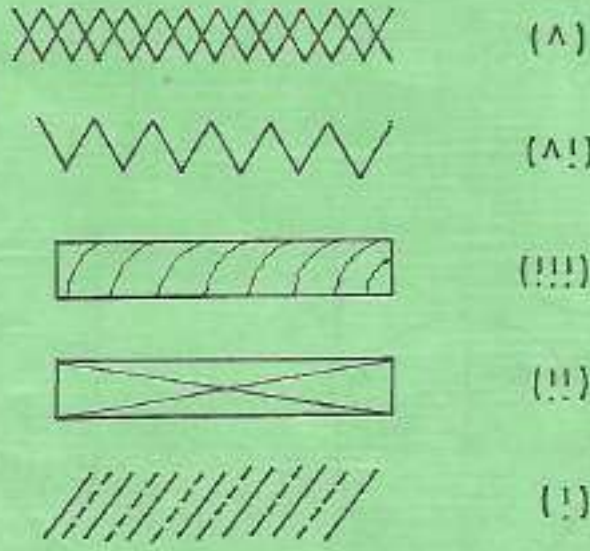
**Candidates should check the question paper to ascertain that
all the pages are printed as indicated and that no questions are missing.**

SECTION A: BUILDING CONSTRUCTION I

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

1. (a) Define the following terms:
- (i) Environment;
 - (ii) Built environment. (6 marks)
- (b) Sketch, dimension and label a builder's square. (5 marks)
- (c) Describe a datum level as used in levelling. (5 marks)
- (d) Using a labelled sketch, explain the working of a site square. (4 marks)
2. (a) (i) Define the term timbering, as used in excavations. (3 marks)
- (ii) State five factors which influence the type of support to be provided to excavated trenches. (5 marks)
- (b) Using sketches illustrate the use of water level in bottoming foundation trenches. (5 marks)
- (c) Using a labelled cross-sectional sketch describe a pad foundation. (7 marks)
3. (a) State five functional requirements for formwork. (5 marks)
- (b) Using labelled cross-sectional sketch describe a beam formwork. (6 marks)
- (c) State five advantages of solid ground floors over suspended ground floors. (5 marks)
- (d) List four materials from which hardcore can be obtained. (4 marks)
4. (a) Briefly describe the following walls:
- (i) masonry wall;
 - (ii) frame wall;
 - (iii) monolithic wall;
 - (iv) membrane wall (8 marks)
- (b) Define the following terms in relation to walls:
- (i) buckling;
 - (ii) overturning. (6 marks)
- (c) State four factors which influence temperature in a building. (6 marks)

(5 marks)



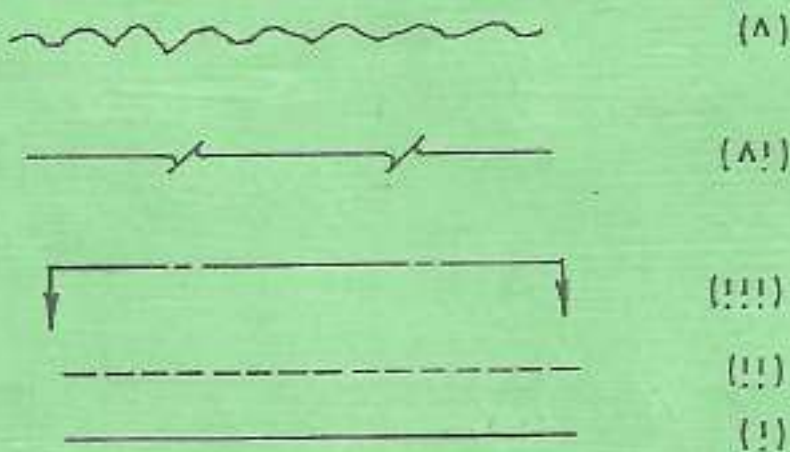
(c) Name the following symbols used in drawing:

(5 marks)

- (i) Names of drawing boards shown: 650 x 470 mm; 920 x 650 mm; 1270 x 920 mm
- (ii) Tee square
- (iii) Set squares
- (iv) Pencils
- (v) French curves

(b) Explain the following instruments as used in technical drawing:

(5 marks)

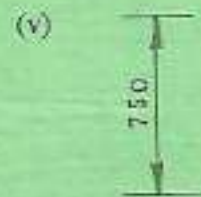
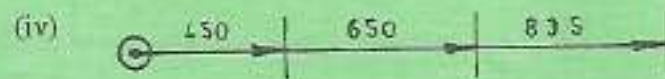
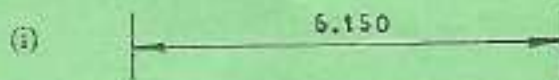


(a) Describe the following lines and state their use in drawing:

Answer at least TWO questions from this section.

SECTION B: DRAWING

(d) Name the following dimension lines:



(5 marks)

6. (a) Given one side of a square as 50 mm to act as the base. Construct a pentagon of sides 50 mm from it.

(6 marks)

(b) Figure 1 shows two equal circles. Construct a common internal tangent to the two given circles.

(7 marks)

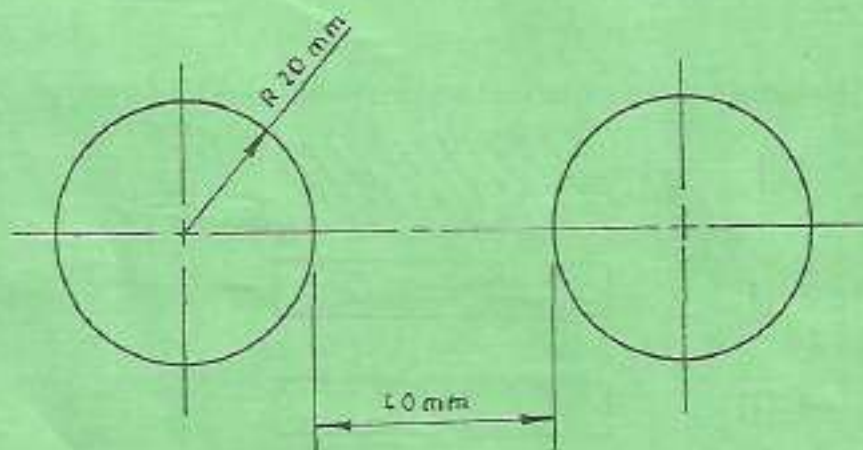


Fig.1

- (c) From the directrix D - D and the focus F given in **Figure 2**, construct a parabola (7 marks)

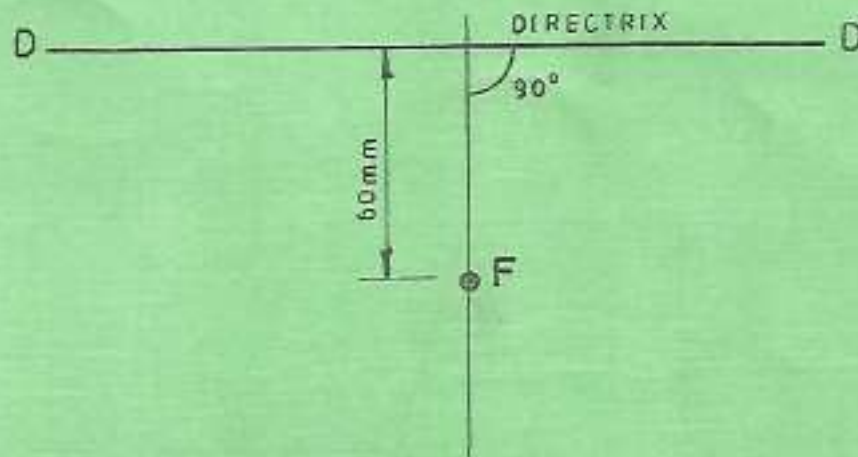


Fig. 2

7. (a) **Figure 3** shows an Isometric drawing of a block. Draw the block in first angle projection with directions of arrow X as the front elevation. (10 marks)

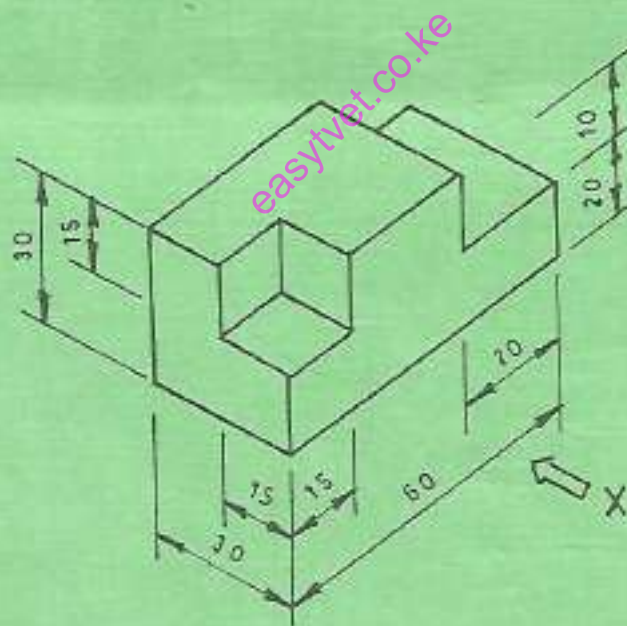


Fig. 3

(b) Figure 4 shows a cylinder intersecting a cone.

(i) Draw the given views and complete the plan;

(ii) Draw the curves of intersection.

(10 marks)

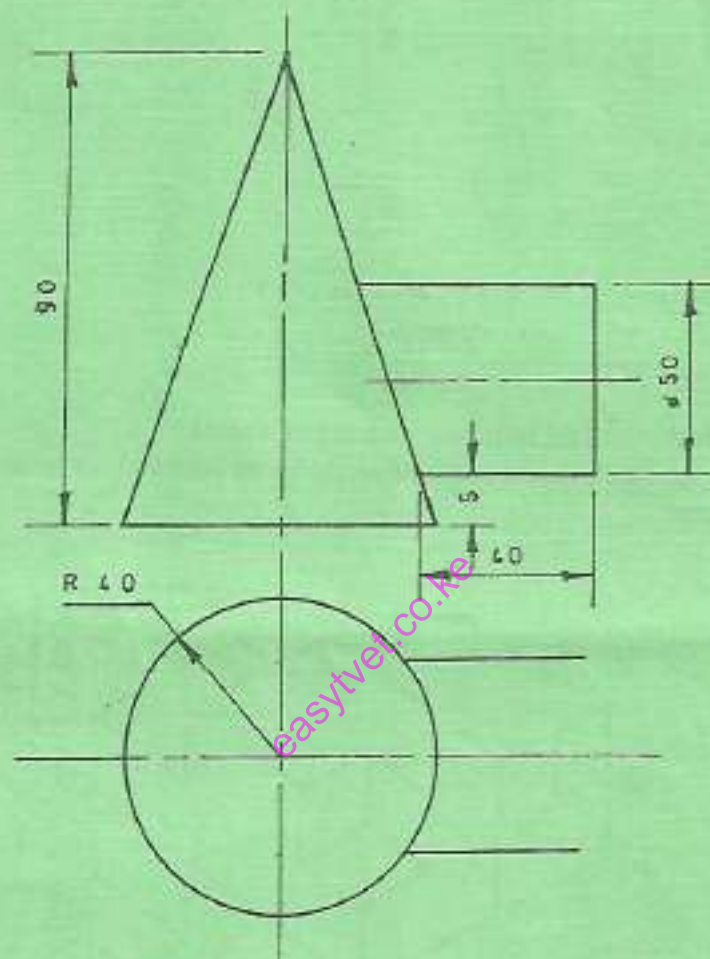


Fig.4

8. A proposed garage with a pitched roof for a residential building is to be constructed on a firm ground as shown in figure 5. The specification for the construction of the garage are as follows:

SPECIFICATIONS

Foundation - Mass concrete 60 mm wide by 200 mm thick
Depth of foundation excavation 500 mm below ground level. (20 marks)

| | | |
|--------------------------|---|---|
| Foundation walling | : | Natural stone 200 mm - thick |
| Hardcore | : | 200 mm thick |
| Blinding | : | 50 mm thick |
| Oversite concrete slab | : | 150 mm thick in dpm |
| Supper structure walling | : | Natural stone 150 mm thick: height = 2500 mm |
| Ring beam | : | Reinforce concrete 150 mm by 150 mm |
| Trusses (timber) | : | 100 mm depth by 50 mm thick |
| Roof | : | Roof pitch : 22° |
| Wall plate | : | 100 x 50 mm |

To scale 1:20 draw and label a vertical section Y - Y
Assume any other information not given.

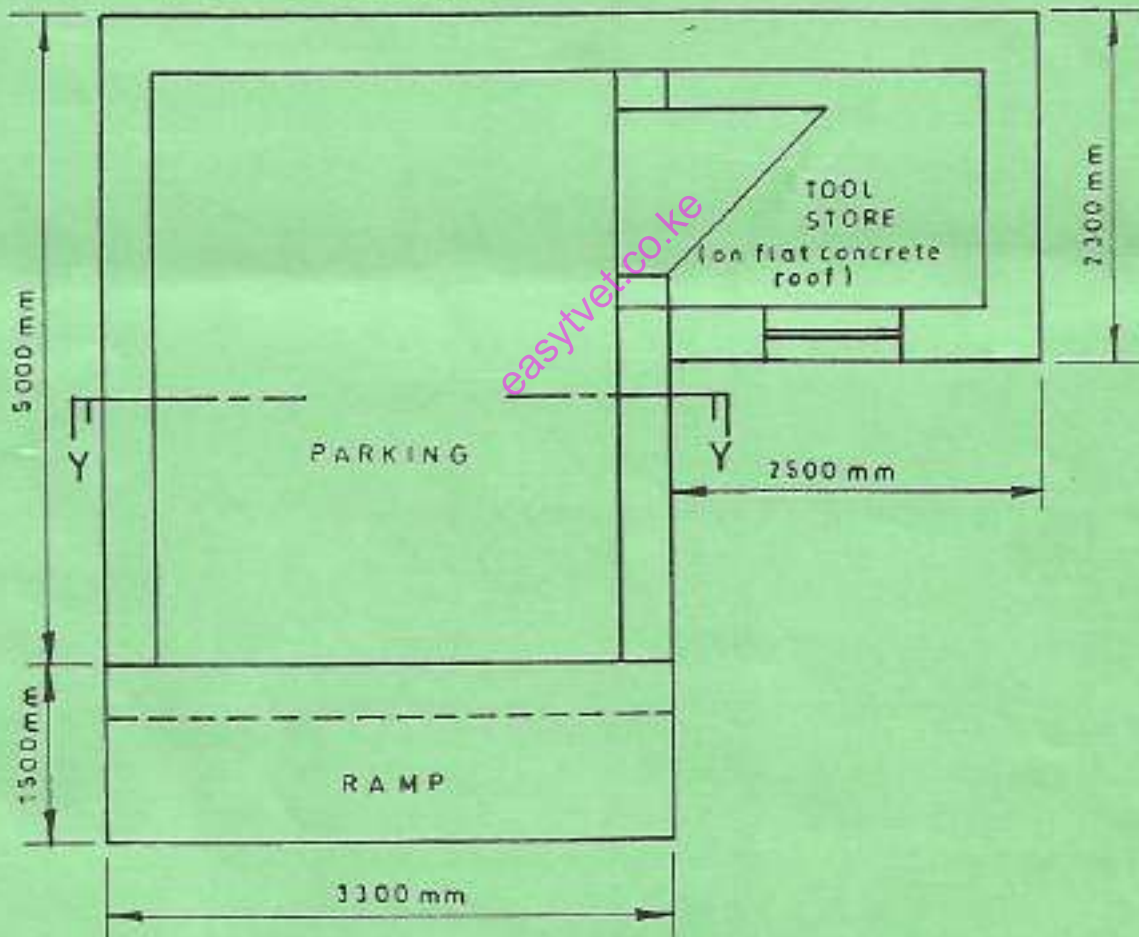


Fig.5

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