2705/303
2709/303
2710/303
BUILDING CONSTRUCTION III,
DRAWING III AND SERVICES
June/July 2017
Time: 3 hours

THE KENYA NATIONAL EXAMINATIONS COUNCIL

DIPLOMA IN BUILDING TECHNOLOGY
DIPLOMA IN ARCHITECTURE

MODULE III

BUILDING CONSTRUCTION III, DRAWING III AND SERVICES

3 hours

INSTRUCTIONS TO CANDIDATES

You should have the following for this examination:
Answer booklet;
A3 drawing paper;
Drawing instruments.
*This paper consists of **EIGHT** questions in **THREE** sections; **A**, **B** and **C**.*
*Answer **FIVE** questions choosing **TWO** questions from section **A**, **TWO** questions from Section **B** and **ONE** question from section **C**.*
*Questions in section **A** carry **25** marks each while those in section **B** carry **15** marks each and those in section **C** carry **20** marks each.*
Maximum marks for each part of a question are indicated.
Candidates should answer the questions in English.

This paper consists of 5 printed pages.

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

Turn over

SECTION A: BUILDING CONSTRUCTION III

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

1. (a) Outline **four** types of framed construction in buildings. (6 marks)

(b) Explain the materials used for the construction of the following:

(i) warehouse;
(ii) factories;
(iii) multi-storey buildings;
(iv) dwelling houses. (8 marks)

(c) Sketch and label a vertical section through a storey height precast concrete cladding. (6 marks)

(d) Sketch and label a vertical cross section of a curtain walling showing aluminium framing, glass and a timber ceiling. (5 marks)

2. (a) (i) Sketch and label a vertical cross section through a reinforced concrete dog leg stair given the following information:

- headroom 2700 mm;
- concrete suspended slab 150 mm;
- total going 2000 mm;
- landing 1200 mm;
- supporting wall 200 mm.

(ii) Sketch and label a vertical section through the balustrade showing the conventional method of fixing it into the concrete. (18 marks)

(b) (i) Outline **three** functional requirements of form work.

(ii) Sketch and label a vertical section through a beam and slab form work. (7 marks)

3. (a) (i) Define scaffolding.

(ii) With the aid of a labelled sketch, describe a putlog scaffolding. (8 marks)

(b) (i) Outline **three** systems of shoring.

(ii) Sketch and label a raking shore. (8 marks)

(c) (i) Explain **three** methods of underpinning a building.

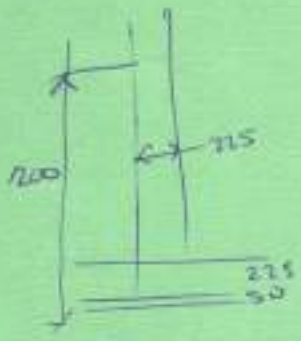
(ii) Outline **three** reasons of underpinning a building. (9 marks)

SECTION B: DRAWING III

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

Figure 1 shows an outline plan of a farm house whose external walls are on a reinforced strip foundation and the over site concrete foundation is resting on a ground beam.
To a scale of 1:5, draw and label section A-A using the following information:

S/No	INFORMATION	
1.	Foundation depth from GL	1200 mm
2.	Depth of ground beam	450 mm
3.	Depth of reinforced foundation strip	225 mm
4.	Reinforcement bars	12 mm Φ high yield
5.	Thickness of wall	225 mm
6.	Hardcore filling thickness	300 mm
7.	Blinding	50 mm
8.	DPM	1000 g



Assume any other information not given. (15 marks)

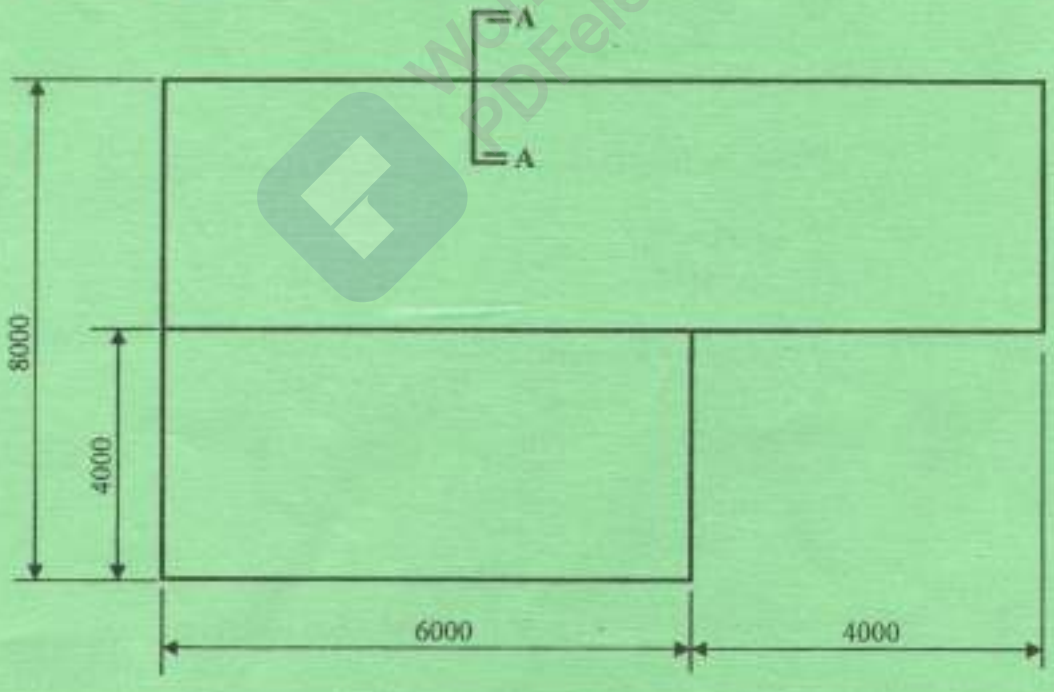


Fig. 1

5. To a scale of 1:10, draw a vertical section through a pitched roof showing the ridge and eaves details, with the following specifications.

S/No	Material Description	Sizes
1.	Timber rafters	100 mm x 50 mm
2.	Timber battens	25 mm x 20 mm
3.	Timber ceiling joists	100 mm x 50 mm
4.	Wall plate	100 mm x 50 mm
5.	Ridge board	150 mm x 32 mm
6.	Timber fascia board	150 mm x 25 mm
7.	Roof covering materials	Plain tiles, 265 mm x 165 mm
8.	Roof pitch	30°

(15 marks)

6. Draw and label a vertical section through a door with a single track top gear and a bottom guide, as follows:

(a) top gear;
(b) bottom track. (15 marks)

SECTION C: SERVICES

*Answer **ONE** question from this section.*

7. (a) (i) Using free hand, sketch the following electrical tools:

(I) flat screw driver;
(II) a pair of pliers;
(III) hacksaw with blade.

(ii) Sketch the following symbols as used in electric services:

(I) switch;
(II) socket. (10 marks)

(b) Outline the following in electricity:

(i) voltage;
(ii) resistance;
(iii) over current;
(iv) short circuit. (6 marks)

(c) State **four** I.E.E. regulations to be observed when installing conduits. (4 marks)

6. (a) State **five** factors that influence the location of manholes in a drainage system. (5 marks)

(b) (i) Explain the following types of ventilation systems:

(I) natural;
(II) mechanical.

(ii) Outline **four** ways of ventilating buildings. (10 marks)

(c) Describe the following tests in a drainage system:

(i) water tests;
(ii) smoke tests. (5 marks)

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