2705/303
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BUILDING CONSTRUCTION III, DRAWING III AND SERVICES
June/July 2019
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;*
- *Scientific calculator;*
- *Drawing instruments;*
- *Drawing paper size A3.*

*This paper consists of **EIGHT** questions in **THREE** sections; **A**, **B** and **C**.*
*Answer **TWO** questions from section **A**, **TWO** questions from section **B** and **ONE** question from section **C**.*
*Each question in section **A** carries **25** marks, section **B** carries **15** marks and section **C** carries **20** marks.*
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) (i) Outline **two** methods of bracing a framed construction against wind.

(ii) State **three** advantages of framed structures over load bearing structures. (6 marks)

(b) Outline **four** advantages of using precast concrete portal frames. (6 marks)

(c) State **two** methods of overcoming each of the following challenges in curtain walling

(i) internal heat gain;
(ii) air borne sound.

(4 marks)

(d) With the aid of labelled plan sketches, explain each of the following classification of stairs:

(i) straight flight;
(ii) dog leg stair;
(iii) open well stair.

(9 marks)

2. (a) Sketch and label a section showing traditional wall underpinning. (5 marks)

(b) Sketch and label a section through a typical single flying shore. (7 marks)

(c) Explain each of the following standards for formwork:

(i) cleaning and treatment of forms;
(ii) procedure when removing the formwork.

(4 marks)

(d) (i) With the aid of a sketch explain the semi-concealed grid method of ceiling assembling.

(ii) Sketch and label a jointless suspended ceiling.

(9 marks)

3. (a) Sketch and label a pictorial putlog steel scaffold. (7 marks)

(b) Explain each of the following internal fixings:
(i) skirting;
(ii) architrave;
(iii) dado rails.
(6 marks)

(c) Outline the procedure of hanging a timber door on a fixed timber frame. (7 marks)

(d) State **five** advantages of steel windows. (5 marks)

SECTION B: DRAWING III

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

4. **Figure 1** shows the plan of a basement floor. To a scale of 1:25 draw section A - A using the following information.

Concrete wall thickness	200 mm
Brick wall thickness	100 mm
Horizontal asphalt tanking	30 mm
Vertical tanking	20 mm
Blinding	100 mm
Height of basement brick wall	2700
Thickness of suspended floor	200 mm
Main reinforcements Y12 @200 c/c	distribution bars Y10 @200 c/c
Assume any other necessary information	

(15 marks)

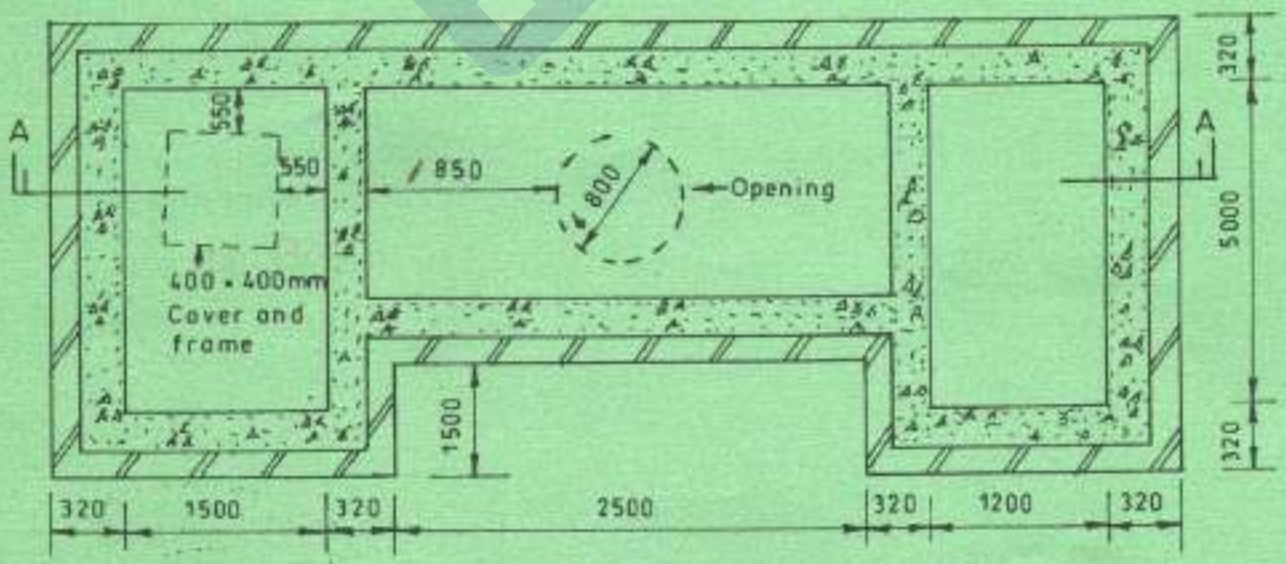

Fig. 1

5. To a scale of 1:10, draw a cross section through an inspection chamber using the following data:

Wall thickness	150 mm
Effective size	750 x 750 mm
Concrete base thickness	150 mm
Masonry wall height	900 mm
Beam	150 mm
Mild steel cover thickness	30 mm
Concrete base size	1200 x 1200 mm
Plaster	20 mm
Inlet and outlet pipe	100 mm ϕ at 100 mm from base

Assume any other necessary information

(15 marks)

6. To a scale of 1:10, draw a section through a rigid pavement using the following data:

Topping	50 mm
Top mesh reinforce cover	50 mm
Mesh termination from end	50 mm
Concrete slab	200 mm
Sub-base (base layer)	250 mm
Partial pavement width	2500 mm

Make any other necessary assumption.

(15 marks)

SECTION C: BUILDING SERVICES

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

7. (a) Explain each of the following terms used in electrical installation:

(i) fuse;
(ii) earthing;
(iii) switch;
(iv) circuit.

(8 marks)

(b) State **five** Institute of Electrical Engineers (IEE) regulations regarding conduits.

(5 marks)

(c) Illustrate a schematic diagram showing the connection from hot water cylinder to appliances in a masionette. (7 marks)

8. (a) (i) State **four** rules for a natural ventilation setup.

(ii) Explain **three** functional requirements of a ventilation system.

(10 marks)

(b) State **four** factors considered when locating a manhole in a drainage system.

(4 marks)

(c) Explain the operation of each of the following types of fire extinguishers:

(i) carbon dioxide (CO_2);
(ii) dry powder;
(iii) wet chemical.

(6 marks)

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