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**BUILDING CONSTRUCTION AND
BUILDING DRAWING III AND
SERVICES**

June/July 2016

Time: 3 hours



THE KENYA NATIONAL EXAMINATIONS COUNCIL

**DIPLOMA IN BUILDING TECHNOLOGY
DIPLOMA IN ARCHITECTURE
MODULE III**

**BUILDING CONSTRUCTION AND BUILDING 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 any TWO questions from Section A, TWO questions from Section B and ONE question in section C.

Each question in Section A carries 25 marks and questions in Section B carries 15 marks whereas each question in section C carry 20 marks.

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

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.**

SECTION A: BUILDING CONSTRUCTION

Answer any **TWO** questions in this section.

1. (a) Figure 1 shows a lien diagram of a structural steel framed construction. Sketch and label detail 'X'. (5 marks)

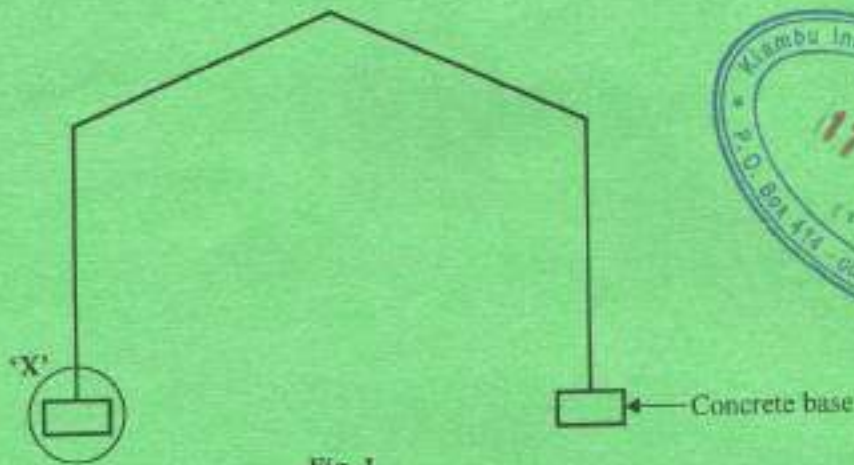


Fig. 1

- (b) (i) State **four** requirements of a fire escape door. (4 marks)
- (ii) Explain the significance of a "fire triangle". (4 marks)
- (c) With the aid of labelled sketches, explain the following:
- (i) cornice
- (ii) skirting
- (iii) architrave. (12 marks)
2. (a) Sketch and label a vertical section of a reinforced concrete dog leg stair. (8 marks)
- (b) Sketch and label a typical T-beam and slab timber formwork. (12 marks)
- (c) Sketch and label a storey height cladding wall finish. (5 marks)
3. (a) State any **four** situations when shoring may be found necessary. (4 marks)
- (b) (i) State any **four** reasons for painting. (4 marks)
- (ii) Define the following as applied to painting
- I prime coat;
- II finishing coat. (2 marks)
- (c) Outline any **four** circumstances under which underpinning would be necessary to a building structure. (4 marks)

- (d) Sketch and label the detail of a suspended ceiling to incorporate light fitting panel. (8 marks)
- (e) State any six factors to consider when selecting a floor finish. (3 marks)

SECTION B: DRAWING III

Answer any TWO questions from this section.

4. A proposed water 'kiosk' for water and sewerage company is to be constructed on a firm ground as shown in Figure 2. The specifications for the construction of the water 'kiosk' are as follows:

Specifications:

Foundation	:	Mass concrete, 600 mm wide by 200 mm thick. Depth of foundation excavation 1000 mm below ground level.
Foundation walling	:	Natural stone 200 mm thick.
Hardcore	:	300 mm thick.
Blinding	:	50 mm thick.
Ground slab	:	150 mm thick solid concrete floor on dpm.
Super structure walling:	:	Natural stone 200 mm thick; height above slab = 2100 mm.
Ring beam	:	Reinforced concrete, 200 mm deep by 200 mm thick.
Roof:	:	Reinforced concrete flat roof 100 mm thick.
Parapet wall	:	Height 700 mm above slab.
Coping	:	Saddle back 100 mm high.

To scale of 1:20 draw and label the vertical section B-B.
Assume any other information not given.

(15 marks)

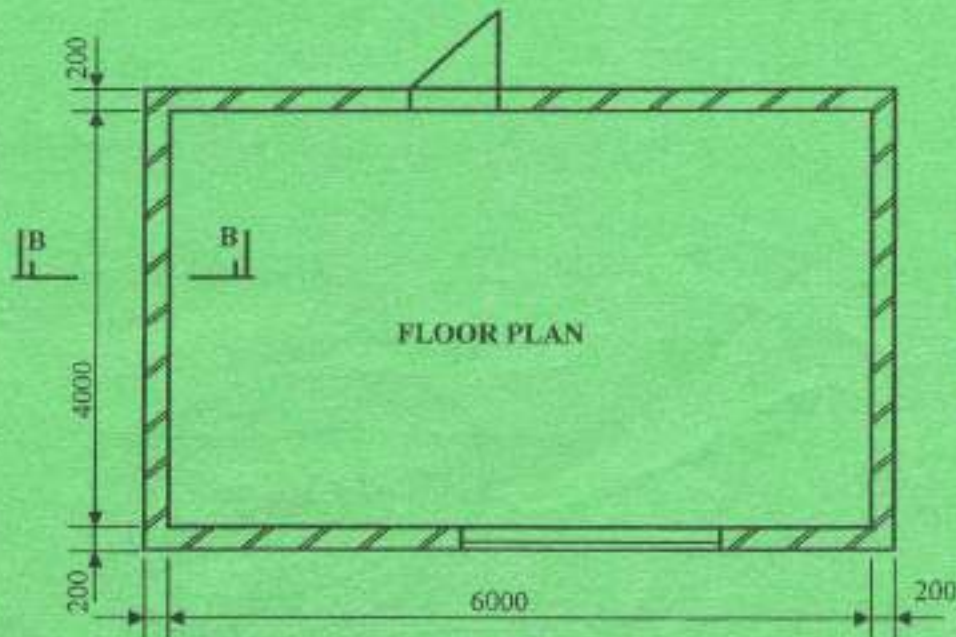


Fig. 2



5. To a scale of 1:10 draw and label a section through the manhole given the following information:

Manhole internal dimensions	:	800 mm x 600 mm.
Concrete bed	:	150 mm thick.
Concrete block wall	:	150 mm thick.
Drain pipe	:	150 mm diameter.
Benching	:	at 45° to horizontal.
Plaster	:	12 mm thick.
Depth of manhole	:	650 mm.
Manhole cover	:	450 x 450 mm.
Top slab (precast)	:	100 mm thick.

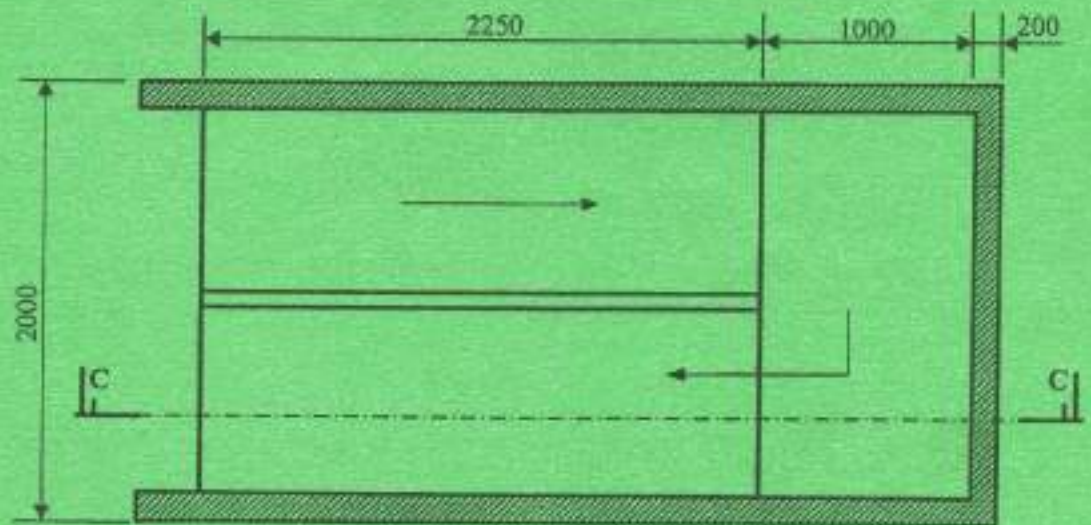
(15 marks)

6. Figure 3 shows the plan of a concrete staircase. To a scale of 1:20 draw section C-C using the following data.

Going 250 mm
 Rise: 150 mm
 Storey height 3000 mm

12.5 runs
7.5 risers
150
7500

(15 marks)



PLAN

Fig. 3



SECTION C: SERVICES

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

7. (a) With the aid of labelled sketches describe the following systems of underground drainage:
- (i) separate system
 - (ii) combined system (8 marks)
- (b) (i) Describe the **two** types of ventilation
- (ii) State any **four** factors to consider when ventilating a room. (8 marks)
- (c) Explain the use of the following tools in electrical installation
- (i) chisel
 - (ii) hacksaw
 - (iii) screw driver
 - (iv) hammer (4 marks)
8. (a) With the aid of a labelled sketch, explain the following:
- (i) indirect cold water supply;
 - (ii) direct cold water supply. (12 marks)
- (b) Outline any **four** requirements of a stairway fire-escape route. (4 marks)
- (c) Differentiate between flammable and inflammable materials. (4 marks)



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