2707/205
BUILDING CONSTRUCTION II,
CIVIL CONSTRUCTION II, AND
TRANSPORTATION ENGINEERING I
June/July 2016
Time: 3 hours

SCGA

THE KENYA NATIONAL EXAMINATIONS COUNCIL

DIPLOMA IN CIVIL ENGINEERING
MODULE II

BUILDING CONSTRUCTION II, CIVIL CONSTRUCTION II AND
TRANSPORTATION ENGINEERING I

3 hours

INSTRUCTIONS TO CANDIDATES

You should have the following for this examination:
Answer booklet;
Drawing instruments;
Drawing paper size A1.
*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** in the answer booklet provided.*
All questions carry equal 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.

Turn over

SECTION A: BUILDING CONSTRUCTION II

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

1. (a) Define the term upper floor. (2 marks)

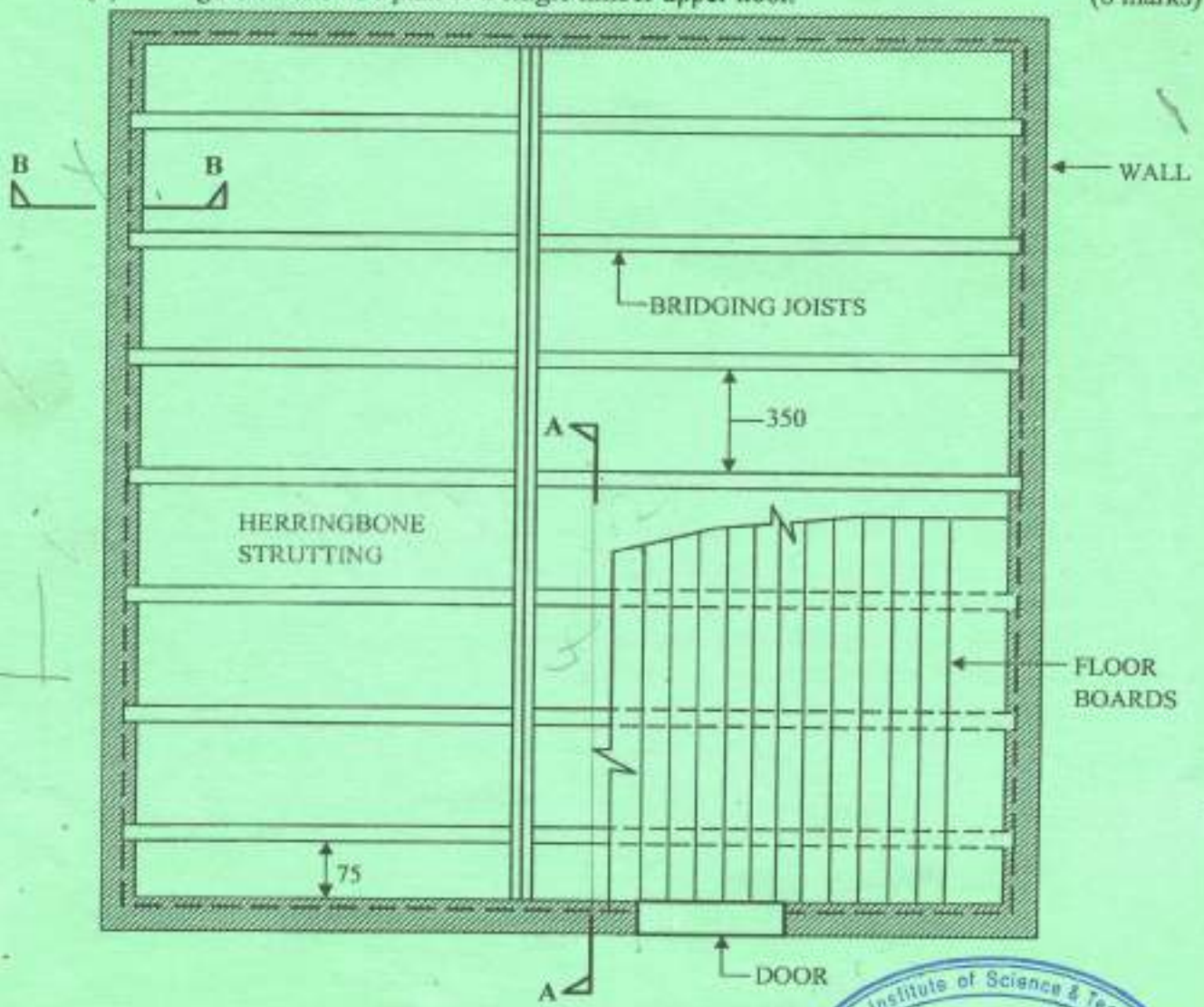
(b) State any:

(i) **three** functions of the upper floor;
(ii) **two** reasons for openings in upper floors.

(5 marks)

(c) With the aid of a sketch, describe an open steel upper floor. (5 marks)

(d) Figure 01 shows a plan of a single timber upper floor. (8 marks)



PLAN

Sketch the details at sections A-A and B-B.

2. (a) State any **three** advantages of steel roof trusses over timber roof trusses. (3 marks)

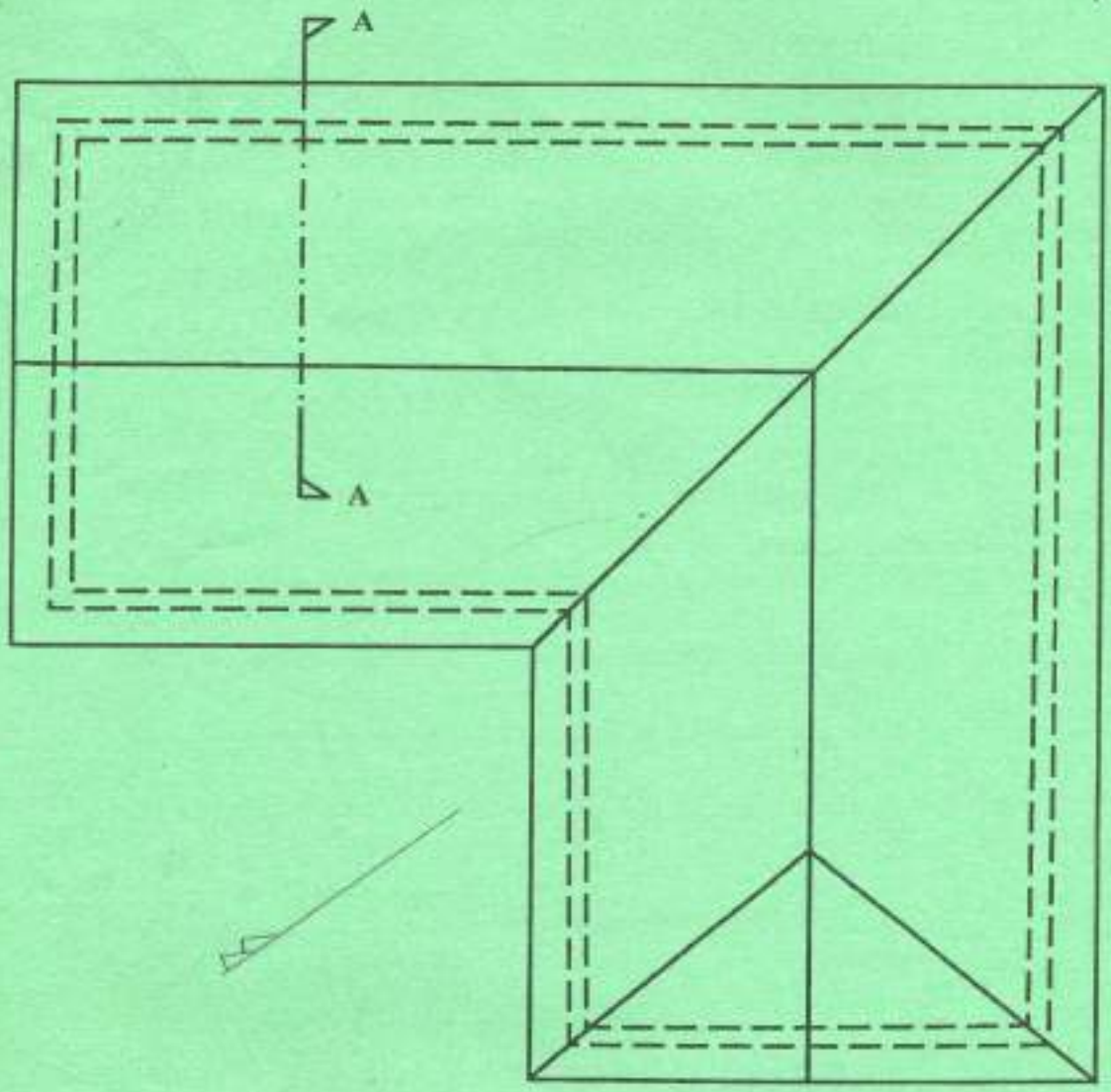
(b) (i) Differentiate between a pitched roof and a flat roof.

(ii) Explain any **two** ways of giving a fall to a timber flat roof. (8 marks)

(c) Figure 02 is a timber roof plan covered with interlocking clay tiles. Sketch the details at section A-A showing:

(i) the rain water goods;
(ii) the closed eave with T&G boarding.

(9 marks)



PLAN

3. (a) State any **four** factors that influence the choice of roofing materials. (4 marks)

(b) With the aid of a sketch, describe the method of fixing a galvanised corrugated iron sheet to timber purlin. (6 marks)

(c) Using the data given, estimate the cost of fixing the G.C.I. sheets on a timber roofing truss.

- G.C.I. gauge 30 with 150 mm end laps and 125 mm side laps with mild steel roofing nails (per m^2).

Data:

- cost of 3 m long gauge 30 G.C.I. = 700/= per sheet.
- cost of 6 kg mild steel roofing nails = 120/= per kg.
- area of roof to be covered = 30 m^2,
- skilled labour taking 4 hours = 100/= per hour
- unskilled labour taking 4 hours = 50/= per hour
- allow for 30% for profits and overheads.

Assume any other information necessary but not given.

(10 marks)

SECTION B: CIVIL CONSTRUCTION II

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

4. (a) (i) Define the term retaining wall. (2 marks)

(ii) State any **two** modes of failure of a retaining wall. (2 marks)

(b) With the aid of sketches, outline the procedures of constructing the following foundations:

(i) an in-situ cast end bearing pile foundation;
(ii) pad foundation.

(14 marks)

(c) State any **two** factors to be considered in design and choice of a foundation. (2 marks)

5. (a) (i) Define the term sleepers as used in construction of railway lines. (2 marks)

(ii) Explain the **two** principal types of railways. (6 marks)

(b) With the aid of sketches, describe the following discharge regulating structures:

(i) sluice gate;
(ii) weirs.

(12 marks)

6. (a) Differentiate between shallow well and deep well. (4 marks)

(b) By use of sketches, outline the construction procedures of the following structures:

(i) wells;
(ii) diaphragm walls.

(14 marks)

(c) State any **two** purposes of maintaining a well. (2 marks)

SECTION C: TRANSPORTATION ENGINEERING I

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

7. (a) State any **four** functions of a road network. (4 marks)

(b) Explain any **three** differences between Telford and Macadam method of pavement of construction. (6 marks)

(c) With the aid of a sketch, describe the Telford Method of road construction. (10 marks)

8. (a) State any **four** principles governing the selection of a highway alignment. (4 marks)

(b) Outline the conventional procedures of surveying for a proposed road. (6 marks)

(c) With the aid of a sketch, describe the setting out procedure of a horizontal curve using deflection of angles method. (10 marks)

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