

SEAN

Name: _____ Index No: _____ / _____

2705/205
 BUILDING CONSTRUCTION II
 AND DRAWING II
 June/July 2015
 Time: 3 hours



Candidate's Signature: _____

Date: _____

THE KENYA NATIONAL EXAMINATIONS COUNCIL

**DIPLOMA IN BUILDING TECHNOLOGY
 MODULE II**

BUILDING CONSTRUCTION II AND DRAWING II

3 hours

**INSTRUCTIONS TO CANDIDATES**

Write your name and index number in the spaces provided above.

Sign and write the date of examination in the spaces provided above.

You should have a Scientific calculator, drawing instruments, metric scale rule/drawing paper size A, for this examination.

This paper consists of **TWO** sections; **A** and **B**.

Answer any **FIVE** questions, choosing at least **TWO** questions from each section in the spaces provided in this question paper.

All questions carry equal marks.

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

Do **NOT** remove any pages from this booklet.

Candidates should answer the questions in **English**.

For Examiner's Use Only

| Section | Question | Maximum Score | Candidate's Score |
|--------------------|----------|---------------|-------------------|
| A | 1 | 20 | |
| | 2 | 20 | |
| | 3 | 20 | |
| | 4 | 20 | |
| B | 5 | 20 | |
| | 6 | 20 | |
| | 7 | 20 | |
| | 8 | 20 | |
| TOTAL SCORE | | | |

This paper consists of 20 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 II

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

1. (a) (i) Explain **two** methods of increasing the load carrying capacity of structural timber roof.
- (ii) Using a line diagram, show each of the following in a corrugated sheet roof covering:
- (I) net cover;
 (II) sheet width;
 (III) side lap. (8 marks)
- (b) With the aid of single line sketches, distinguish:
- (i) short span roof from large span roof;
 (ii) lattice girder frame from bowstring roof. (6 marks)
- (c) Explain **three** advantages of using hollow pots in upper floor construction. (6 marks)
2. (a) (i) Outline **four** reasons for providing openings in upper floors.
- (ii) With the aid of labelled sketches, show each of the following floor components:
- (I) trimmer beams and trimmer;
 (II) hollow beams and mild steel straps. (12 marks)
- (b) An upper timber floor is to be constructed in 75 mm wide joists spaced at 450 mm centre to centre.
 If the floor span is 3800 mm, calculate the depth of the timber joists. (3 marks)
- (c) Sketch and label a double purlin roof. (5 marks)
3. (a) (i) Name **four** tile roof coverings.
- (ii) State **two** advantages and **two** disadvantages of each of the following as roofing materials:
- (I) timber;
 (II) steel. (6 marks)



- (b) (i) State **two** functional requirements of roofs.
- (ii) By use of pictorial labelled sketches, differentiate between intersecting barrel and northlight barrel vaults.
- (iii) Sketch and label a typical shell barrel vault. (14 marks)
4. (a) (i) State **four** span ranges for floors.
- (ii) Highlight **four** characteristics of BRC mesh as used in floors. (6 marks)
- (b) Explain **three** methods of stabilising a roof structure to withstand wind loads. (6 marks)
- (c) Sketch a section through a hollowpot suspended floor showing electrical conduit services, BRC mesh and 50 mm concrete topping. (8 marks)



SECTION B: DRAWING II

Answer at least TWO questions from this section.

5. (a) State **three** purposes of town planning. (3 marks)
- (b) Outline **three** roles of each of the following parties involved in the construction industry:
- (i) financier;
- (ii) physical planner;
- (iii) NEMA. (9 marks)
- (c) Write specifications for each of the following building materials:
- (i) mass concrete;
- (ii) building stone. (8 marks)

6. Figure 1 shows a line diagram of a timber roof to be constructed over a stone wall.

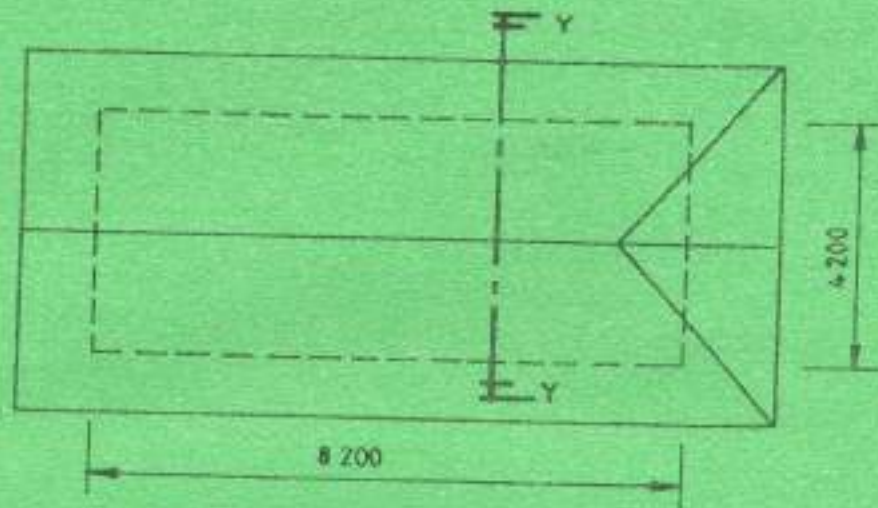


Fig. 1

- (a) To a scale of 1:50 draw the plan layout of the roof work. (13 marks)
- (b) To a scale of 1:10 draw a symmetrical truss to show the construction detail Y-Y. (7 marks)

DATA

- Ring beam 200 mm x 200 mm
- Trusses @ 1200 c/c with common rafters in between
- Common rafters 100 x 50 mm
- Ridge board 150 mm x 50 mm
- Wall plate 100 mm x 50 mm bolted on ring beam
- Struts/braces 100 mm x 32 mm
- Trussed rafter twin 100 mm x 32 mm
- Ms angle cleat size 100 x 100 x 6 mm screwed to wall plate and bolted to truss
- Roof overhung 600 mm
- Pitch of roof 30°

NB. Make any necessary assumption.



7. Figure 2 shows a timber casement window.

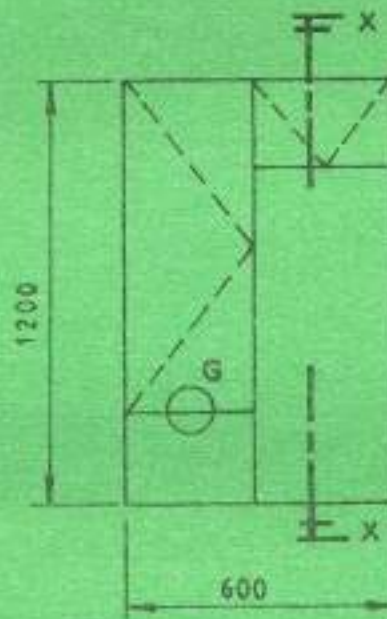
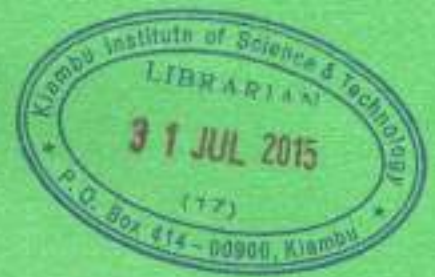


Fig. 2



Using the data provided:

- (a) To a scale of 1:10 draw and label the elevation of the window. (10 marks)
- (b) To a scale of 1:5
- (i) draw section X-X;
- (ii) detail the glazing at G. (10 marks)

DATA

- Ring beam 200 x 200 mm
- Wall thickness 200 mm with 3 ply DPC
- Glazing clear 4 mm in timber beading secret nailed
- Cill timber 145 x 35 mm with throating
- Window board 145 x 200 mm with camphor, tongue to insert in groove on cill
- Frame member 95 x 35 mm
- Sash framing 60 x 25 mm
- Rebate depth 20 mm on frame while on sash 12 mm both ways
- Assume any other information

8. Figure 3 shows the plan outline of the walls of an octagonal chapel with base radius 8000 mm.

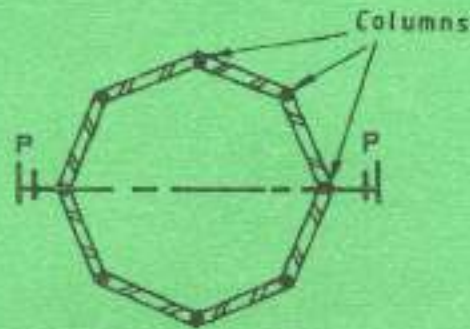


Fig.3

Using the data given and to a scale of 1:100

- (a) Draw the layout plan; (12 marks)
- (b) Draw the vertical section P-P to show the construction elements up to DPC level. (8 marks)

DATA

- Wall 200 mm
- Column base radius 1000 mm
- Octagonal column diameter 300 mm
- Column reinforcement 6 Y25
- Distribution bars R10
- Base reinforcement Y25
- Blinding 75 mm (1:3:6) concrete
- Depth of concrete base 300 mm thick
- Depth of substructure column 2000 mm
- Depth of slab 250 mm (1:2:4) concrete
- Depth of hardcore 450 mm
- Dpm 1000 g, BRC A 169
- Make any other assumption.

