2705/205
BUILDING CONSTRUCTION II AND
DRAWING II
Oct./Nov. 2021
Time: 3 hours

THE KENYA NATIONAL EXAMINATIONS COUNCIL

DIPLOMA IN BUILDING TECHNOLOGY

MODULE II

BUILDING CONSTRUCTION II AND DRAWING II

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 **TWO** sections; **A** and **B**.*
*Answer **FIVE** questions choosing **TWO** questions from section **A**, **TWO** questions from section **B** and **ONE** question from either section.*
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 8 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 at least **TWO** questions from this section.*

1. (a) State **five** advantages of hollow pot floor over solid concrete floor. (5 marks)

(b) **Figure 1** shows a tongue and grooved timber upper floor, sketch and label through section C-C. (5 marks)

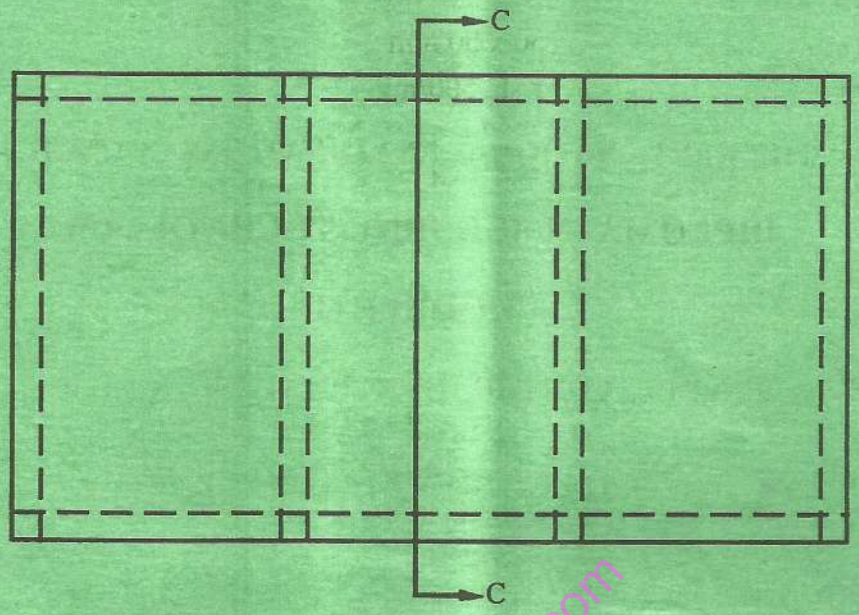


Fig. 1: Tongue and Grooved Timber Floor

(c) (i) Sketch and label a suspended slab and beam form work.

(ii) State **five** reasons for adopting pre-cast concrete in upper floors. (10 marks)

2. (a) Explain the function of the following members of a roof:

(i) rafter;
(ii) purlin;
(iii) tie beam;
(iv) struts.

(8 marks)

(b) Differentiate between single and double roofs. (4 marks)

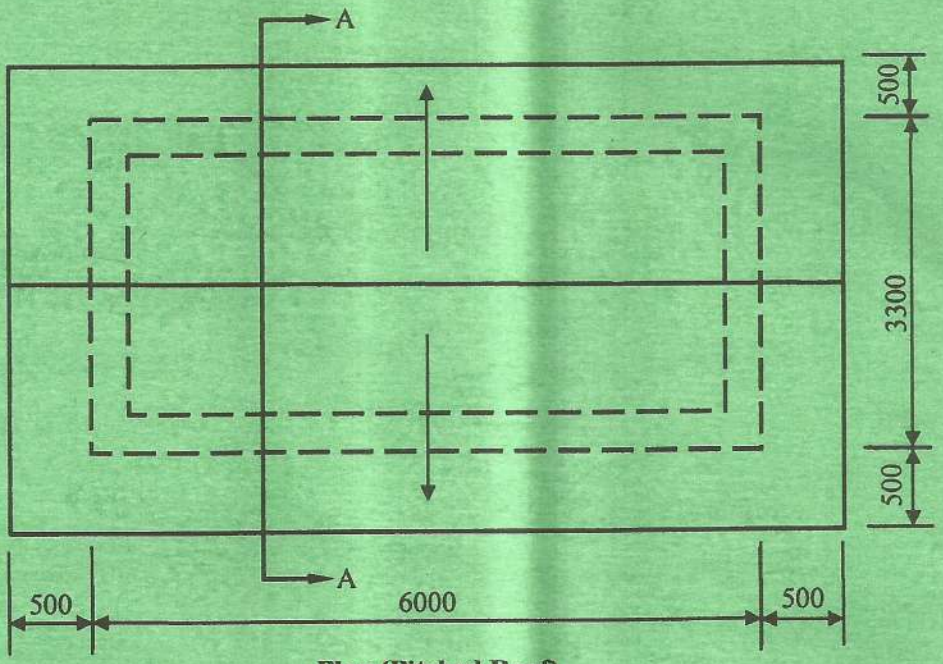
(c) (i) With the aid of a labelled sketch, explain a parabolic dome roof.

(ii) State **two** advantages of shell roofs as compared to traditional roof construction. (8 marks)

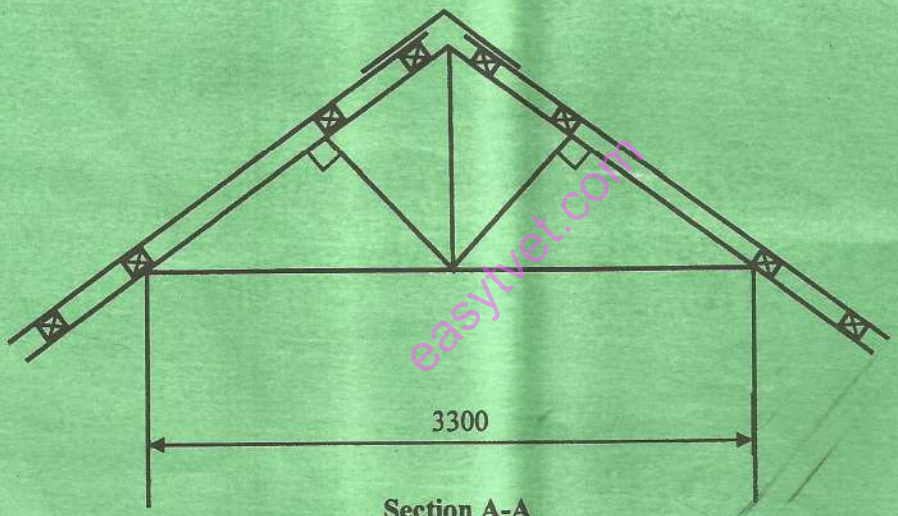
3. **Figure 2** shows a pitched roof, estimate the cost of the roof structure and its roofing materials using the information given based on the plan and section. (20 marks)

DATA

Tie beam		-	100 x 75 mm
Rafters		-	75 x 50 mm @ 1200 c/c
Struts		-	75 x 50 mm
King post		-	100 x 75 mm
Purlins (4 no)		-	50 x 50 mm
G.C.I sheet		-	Ksh. 500/m^2
Cost of timber		-	25000/m^3
Nails	- Ordinary	-	8 kg @ 150/kg
	- Roofing	-	5 kg @ 200/kg
Wall plate		-	100 x 75 mm
Redge cap		-	Ksh. 500 / 2 m piece
Waste		-	2.5%



Plan (Pitched Roof)



Section A-A

Fig. 2

4. (a) Explain **three** functional requirements of a roof covering. (6 marks)

(b) Sketch and label a section through a makuti roof. (5 marks)

(c) (i) Outline the procedure of fixing a two row G.C.I sheet.

(ii) Sketch and label a cross-section of a typical two row G.C.I sheet roof. (9 marks)

SECTION B: DRAWING I

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

5. (a) State **two** types of construction specification. (2 marks)

(b) State **three** reasons for air exchange systems in a building. (3 marks)

(c) **Figure 3** shows a flow plan of a domestic building. Draw a vertical section X-X to a scale of 1:20 up to and including the wall plate using the information given. (15 marks)

DATA

Floor slab	-	150 mm
Foundation strip footing	-	600 x 200 mm
Wall height	-	2100
Foundation blinding	-	50 mm
Foundation wall depth	-	900 mm
Hard core filling	-	200 mm
Blinding	-	50 mm
Door	-	900 mm wide
Super structure wall	-	150 mm thick
Ring beam	-	150 x 200 mm
Wall plate	-	100 x 50 mm
Foundation wall thickness	-	200 mm
Floor finish	-	20 mm

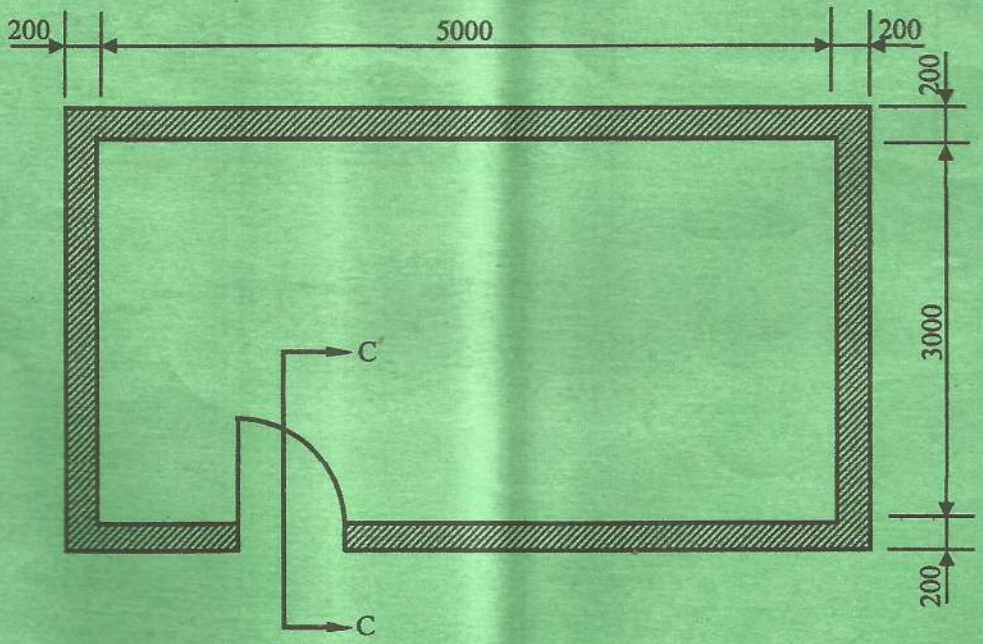


Fig. 3: Floor Plan of a Domestic Building

6. (a) Differentiate between storage and industrial types of buildings giving **one** example in each. (5 marks)

(b) **Figure 4** shows a roof plan. To a scale of 1:10, draw section Y-Y using the information given. (15 marks)

DATA

Roof pitch angle	-	30°
Wall thickness	-	200 mm
Wall plate	-	100 x 75 mm
Rafter	-	100 x 75 mm
Purlin	-	75 x 50 mm
Struts	-	75 x 50 mm
King post	-	100 x 50 mm
Tie beam	-	100 x 75 mm

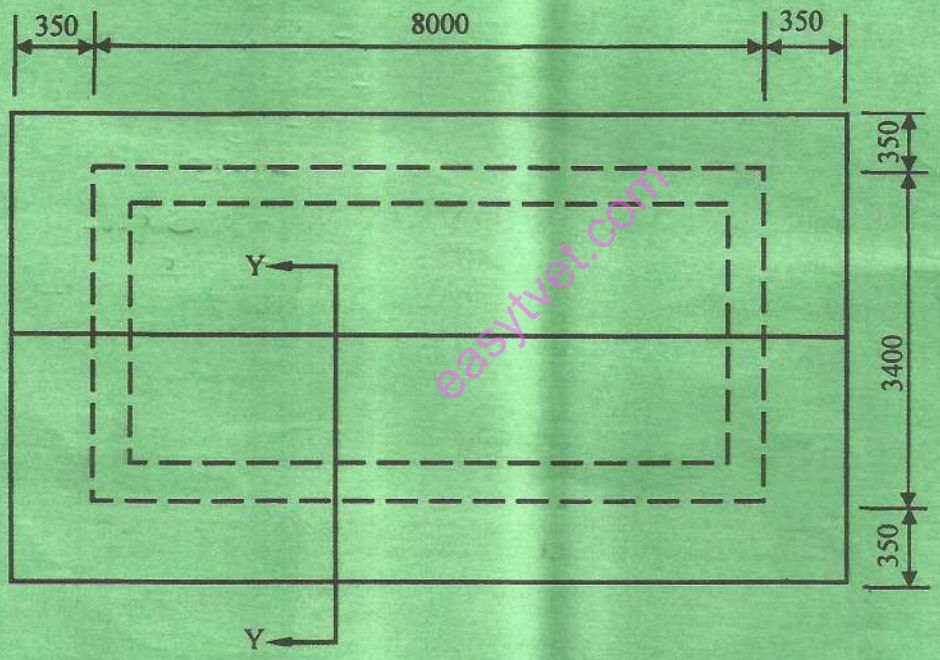


Fig. 4: Roof Plan

7. (a) State **five** roles of a structural engineer. (5 marks)

(b) **Figure 5** shows a plan of an R.C.C combined column base. To a scale of 1:25, draw section B-B. (15 marks)

DATA

Depth of column	-	1500 mm
Depth of column base	-	750 mm
Blinding	-	50 mm
Transverse reinforcement	-	T10 @ 150 mm c/c
Covers	- 25 mm for columns	
	- 50 mm for column bases	

Make assumptions for other information.

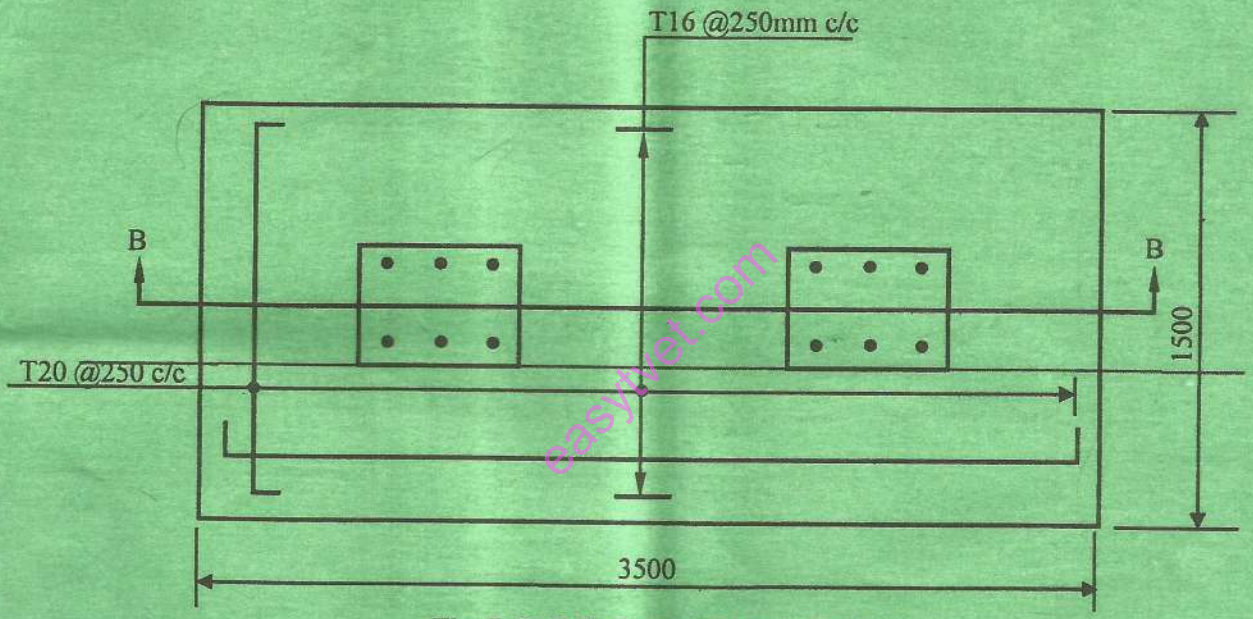


Fig. 5: R.C.C. Combined Column Base

8. **Figure 6** shows a line diagram of a church hall. To a scale of 1:100 and 1:50;

(a) Redraw the detailed plan to a scale of 1:100. (7 marks)

(b) Draw the elevation from the direction of the arrow Z to a scale of 1:50. (13 marks)

DATA

External dimensions are as shown.

Windows	-	1500 x 1500
Doors - D1	-	1500 x 2400
- D2	-	900 x 2400
Ring beam	-	200 x 200
Type of roof	-	Gable
Roof pitch angle	-	30°
Wall thickness	-	200 mm
Eave projection	-	500 mm
Ceiling height	-	3000 mm
Slab thickness	-	150 mm
Door opening	-	1500 x 2400 with an arch

Make assumptions where applicable.

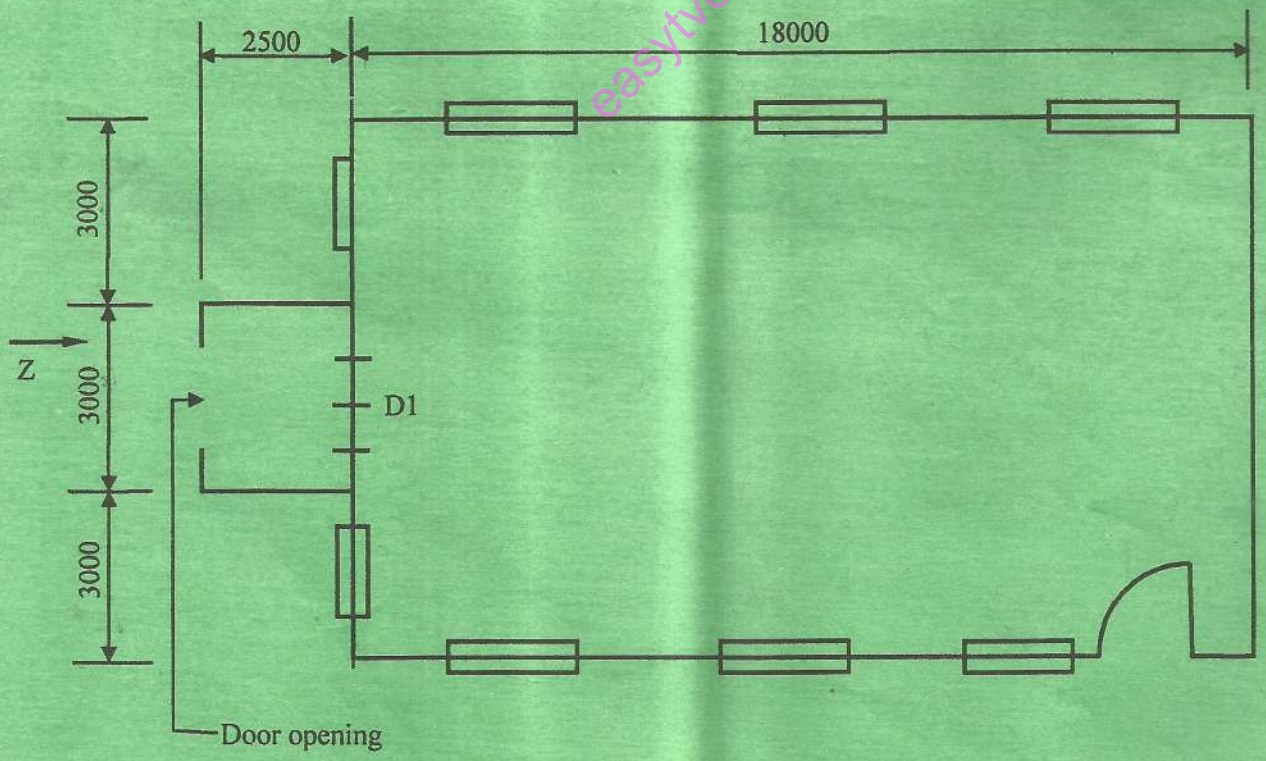


Fig. 6: Line Diagram of a Church Hall

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