

To scan

2707/205  
BUILDING CONSTRUCTION II,  
CIVIL ENGINEERING CONSTRUCTION AND  
TRANSPORT ENGINEERING I  
Oct./Nov. 2018  
Time: 3 hours



THE KENYA NATIONAL EXAMINATIONS COUNCIL

DIPLOMA IN CIVIL ENGINEERING

MODULE II

BUILDING CONSTRUCTION II, CIVIL ENGINEERING CONSTRUCTION AND  
TRANSPORT ENGINEERING I

3 hours

**INSTRUCTIONS TO CANDIDATES**

*You should have the following for this examination:*

- Answer booklet;*
- Drawing instruments;*
- Mathematical tables/scientific calculator.*

*The paper consists of EIGHT questions in THREE sections: A, B and C.*

*Answer any FIVE questions; choosing THREE questions from section A, ONE question from section B and ONE question from section C in the answer booklet.*

*All questions carry equal marks.*

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

## SECTION A: BUILDING CONSTRUCTION II

Answer **THREE** questions from this section.

1. (a) Explain **three** advantages of upper timber floors. (6 marks)
- (b) Explain **three** functional requirements of a roof. (6 marks)
- (c) With the aid of a labelled sketch, explain the following terms as applied to roofs:
- (i) overall span;
  - (ii) rise;
  - (iii) pitch.
- (8 marks)

2. (a) Sketch the following timber joints used in wall plate:
- (i) longitudinal halved joint;
  - (ii) angle halved joint;
  - (iii) tee halved joint.
- (6 marks)
- (b) **Figure 1** shows the plan and section of a 'bodaboda' roof shed. Estimate the cost of roofing the shed using purpose made iron sheets given the following data: (14 marks)

Cost of 3 m long gauge 30 iron sheets @ Ksh 1500

Cost of 100 mm x 75 mm timber boards @ Ksh 100 per metre

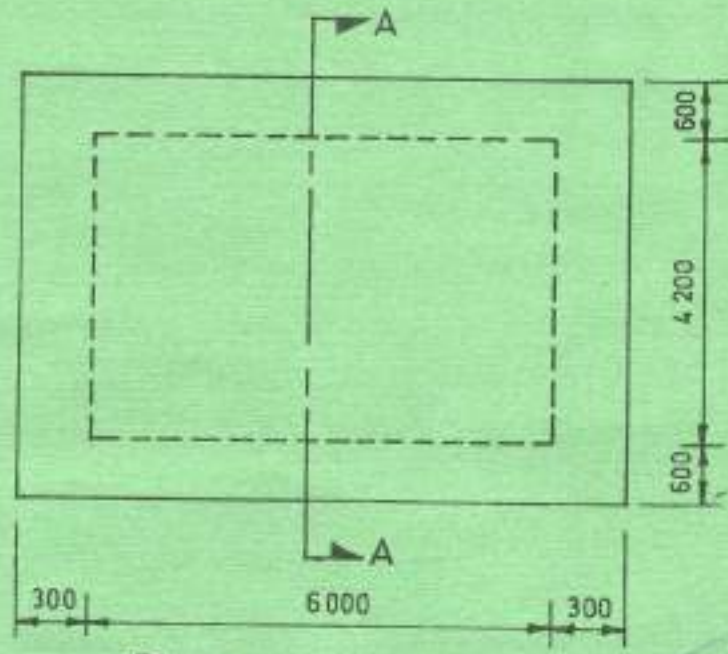
Cost of 75 mm x 50 mm timber boards @ Ksh 90 per metre

Cost of M.S roofing nails 1 kg @ Ksh 150

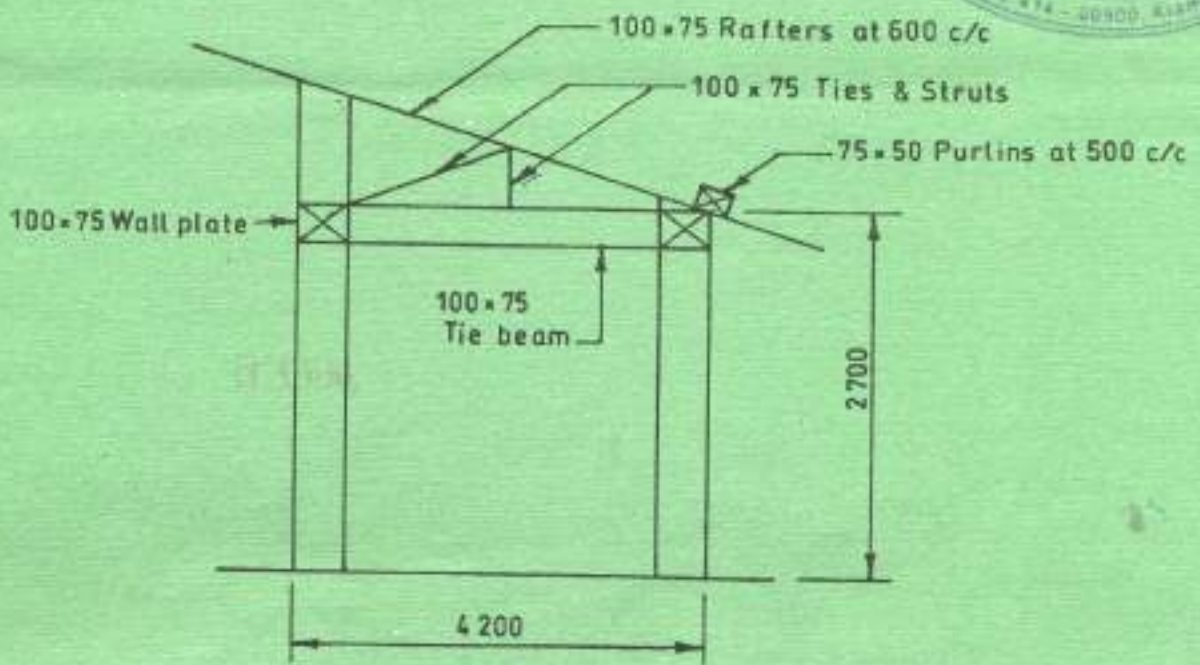
Cost of ordinary nails 1 kg @ Ksh 100

Assume any other necessary information.





Plan



Section A-A

Fig. 1

3. (a) State **four** merits of steel trusses over timber trusses. (4 marks)
- (b) Outline the procedures for constructing a solid concrete upper floor under the following headings:
- (i) erection of formwork;
- (ii) casting of concrete. (10 marks)
- (c) Sketch and label the following types of roof trusses:
- (i) compound howe truss;
- (ii) queen post truss. (6 marks)

### SECTION B: CIVIL ENGINEERING CONSTRUCTION

*Answer TWO questions from this section.*

4. (a) State **four** causes of failure in dams. (4 marks)
- (b) Explain the term retaining wall as used in dams. (2 marks)
- (c) With the aid of a labelled sketch, explain the action of the following pressures on a retaining wall:
- (i) active pressure;
- (ii) passive pressure;
- (iii) ground bearing pressure. (6 marks)
- (d) Explain **four** functions of foundations. (8 marks)
5. (a) State **three** reasons for tunnelling. (3 marks)
- (b) Outline **three** advantages of concrete dams over earth dams. (3 marks)
- (c) With the aid of a labelled sketch, describe a shallow well in unstable grounds. (7 marks)
- (d) (i) State **two** effects of dampness on underground structures.
- (ii) Sketch and label a section through a concrete basement showing details of external tanking. (7 marks)



6. (a) (i) Explain the term dolphin as used in water front structures.  
 (ii) Describe two types of dolphins. (6 marks)
- (b) Sketch and label the following discharge regulating structures:  
 (i) side channel spillway;  
 (ii) trough spillway;  
 (iii) drum gate spillway. (9 marks)
- (c) Sketch and label a longitudinal section through a bearing plate in a railway line. (5 marks)



### SECTION C: TRANSPORT ENGINEERING I

*Answer ONE question from this section.*

7. (a) Outline four sources of information for a site investigation. (6 marks)
- (b) With the aid of a labelled sketch, explain the setting out procedure for a circular curve using offsets from the long chord. (6 marks)
- (c) Differentiate between passing and meeting sight distances. (2 marks)
- (d) Explain three factors that justify the provision of grade separated intersections. (6 marks)
3. (a) Sketch and label a section through a rigid pavement. (3 marks)
- (b) (i) With the aid of a sketch, explain the variation of stress with the depth on a road pavement.  
 (ii) Explain the disparity in stability requirements in the layers of a flexible pavement relative to (i) above. (8 marks)
- (c) Describe the Kenyan rural road design procedure using the relevant manual. (9 marks)

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