

To scan

2707/303  
**BUILDING CONSTRUCTION III AND  
 TRANSPORT ENGINEERING II**  
 Oct./Nov. 2018  
 Time: 3 hours



THE KENYA NATIONAL EXAMINATIONS COUNCIL

**DIPLOMA IN CIVIL ENGINEERING**

**MODULE III**

**BUILDING CONSTRUCTION III AND TRANSPORT ENGINEERING II**

**3 hours**

**INSTRUCTIONS TO CANDIDATES**

*You should have the following for this examination:*

*Answer booklet;*

*Drawing instruments.*

*This paper consists of EIGHT questions in TWO sections A and B.*

*Answer any FIVE questions choosing at least TWO questions from each section.*

*All questions carry equal marks.*

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

*Relevant design tables are attached.*

*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 III

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

1. (a) Outline **four** ways in which wind bracing is achieved in framed construction. (6 marks)
- (b) Highlight **four** advantages of framed structures over load bearing structures. (4 marks)
- (c) Outline **three** methods of overcoming excessive stresses at the foundation for framed construction. (3 marks)
- (d) With the aid of a labelled sketch, explain a single storey rigid portal frame format. (5 marks)
- (e) State **two** methods of eradicating internal heat gain in curtain walling. (2 marks)
2. (a) With the aid of a labelled sketch, explain cerfax hoopsafe underpinning. (5 marks)
- (b) Outline **two** building code requirements for formwork. (4 marks)
- (c) State **three** conditions that necessitate shoring. (3 marks)
- (d) Sketch and label each of the following hinges and state where each is used:
  - (i) rising butt hinge;
  - (ii) band and hook hinge. (8 marks)
3. (a) **Figure 1** shows the area to be taken by a stair. Using the data provided:
  - (i) design the stair;
  - (ii) to a scale of 1:50, draw the plan of the stair indicating risers and treads. (10 marks)

#### Data

Floor to headroom height	2550 mm
Slab thickness	150 mm
Width of flight	1000 mm
Wall thickness	200 mm
Rise	150 mm
Landing	1200 mm





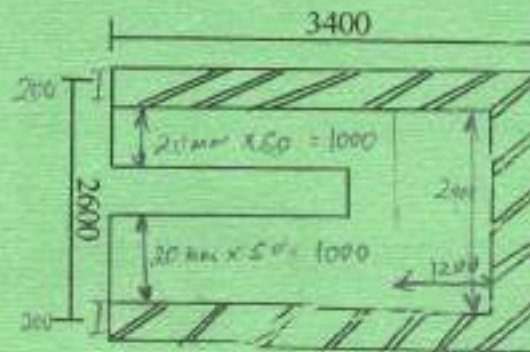


Figure 1

Institute of Science & Technology  
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- (b) Sketch and label a suspended ceiling and state its purpose. (5 marks)
  - (c) Sketch and label an independent scaffolding. (3 marks)
4. (a) Outline the cause of each of the following paint defects and state the remedy for each:
- (i) bloom;
  - (ii) curtaining;
  - (iii) chalking.
- (6 marks)
- (b) Sketch and label each of the following internal fixings:
- (i) skirting;
  - (ii) cornice;
- (6 marks)
- (c) Highlight two thumb rules used to determine the window area for a room. (4 marks)
- (d) Differentiate first fixing from second fixing. (4 marks)



## SECTION B: TRANSPORTATION ENGINEERING II

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

5. (a) State **three** merits and **three** demerits of each of the following methods of road construction:
- (i) labour intensive; *(Uses locally available materials)*
- (ii) capital intensive.
- (b) (i) Define 'soil stabilisation'.
- (ii) Outline **two** types of soil stabilisation for each of the following classifications:
- (I) mechanical stabilisation;
- (II) chemical stabilisation.
- (c) Outline **four** characteristics of each of the following:
- (i) bitumen;
- (ii) tar.
6. (a) Outline **four** factors that influence the stability of side slopes of an excavation.
- (b) Sketch and label a cross section through an urban two lane dual carriageway with a median separation.
- (c) Explain **five** activities performed during the earthworks phase in a cut section of road construction.
7. (a) Name and sketch **two** types of permanent way rails.
- (b) Explain each of the following railway line components and outline **two** functions of each:
- (i) formation;
- (ii) sleepers.





- (c) (i) Distinguish dredging from reclamation.
  - (ii) Outline the process of dredging using a grapple dredger. (10 marks)
8. (a) (i) Define road maintenance. (8 marks)- (ii) Explain two classes of road maintenance. (8 marks)
- (b) Outline the procedure of slurry sealing. (6 marks)
- (c) State three types of damages on earth roads and outline a remedy for each. (6 marks)

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