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.

Turn over

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 underpining. (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

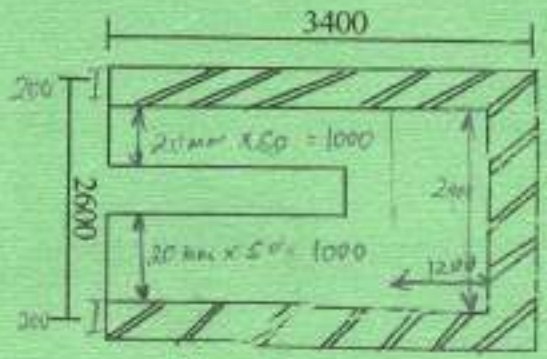

Figure 1

(b) Sketch and label a suspended ceiling and state its purpose. (5 marks)

(c) Sketch and label an independent scaffolding. (5 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;

(ii) capital intensive. (6 marks)

(b) (i) Define 'soil stabilisation'.

(ii) Outline **two** types of soil stabilisation for each of the following classifications:

(I) mechanical stabilisation;

(II) chemical stabilisation. (8 marks)

(c) Outline **four** characteristics of each of the following:

(i) bitumen;

(ii) tar. (6 marks)

6. (a) Outline **four** factors that influence the stability of side slopes of an excavation. (6 marks)

(b) Sketch and label a cross section through an urban two lane dual carriageway with a median separation. (4 marks)

(c) Explain **five** activities performed during the earthworks phase in a cut section of road construction. (10 marks)

7. (a) Name and sketch **two** types of permanent way rails. (3 marks)

(b) Explain each of the following railway line components and outline **two** functions of each:

(i) formation;

(ii) sleepers. (7 marks)

(c) (i) Distinguish dredging from reclamation.

(ii) Outline the process of dredging using a grapple dredger. (10 marks)

8. (a) (i) Define road maintenance.

(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)

THIS IS THE LAST PRINTED PAGE.