

2707/303
BUILDING CONSTRUCTION III AND
TRANSPORTATION ENGINEERING II
June/July 2019
Time: 3 hours



THE KENYA NATIONAL EXAMINATIONS COUNCIL

DIPLOMA IN CIVIL ENGINEERING

MODULE III

BUILDING CONSTRUCTION III AND TRANSPORTATION ENGINEERING II

3 hours

INSTRUCTIONS TO CANDIDATES

You should have the following for this examination:

Answer booklet;

Scientific calculator.

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 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 III

Answer at least TWO questions from this section.

1. (a) State two methods used to reduce each of the following cases in curtain walling:
- (i) airborne sound;
 - (ii) internal heat gain. (4 marks)
- (b) With the aid of a cross-sectional sketch, describe a safe method of underpinning foundations subject to differential settlement. (7 marks)
- (c) Outline the procedure of plastering a newly constructed masonry wall. (9 marks)
2. (a) Describe the following internal fixtures stating one function of each:
- (i) architraves;
 - (ii) cornices. (4 marks)
- (b) With the aid of a sketch, explain the procedure of fixing vertical timber cladding to a masonry wall backing. (9 marks)
- (c) (i) Sketch and label a section through a single needle scaffold.
- (ii) State two circumstances under which the scaffold in (i) above is used. (7 marks)
3. (a) Sketch and label a section through a wall to show each of the following types of pointing:
- (i) tuck;
 - (ii) struck;
 - (iii) beaded. (9 marks)
- (b) State a remedy for each of the following defects in painting:
- (i) bloom;
 - (ii) bleeding;
 - (iii) chalking. (3 marks)



SECTION B: TRANSPORTATION ENGINEERING II

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

15-15-18

5. (a) (i) Illustrate **two** major activities in earthworks for road construction. (5 marks)
- (ii) Explain the importance of balancing the activity in (i) above. (5 marks)
- (b) Outline the construction procedure for an earth road. (5 marks)
- (c) (i) State **three** functions of traffic island.
- (ii) Explain the term 'road furniture' stating **two** examples. (6 marks)
- (d) Explain **two** roles of trial sections in road construction quality control. (4 marks)

6. (a) Explain:
- (i) The importance of sourcing construction materials near a road alignment. (4 marks)
- (ii) The mechanical stabilization of road construction materials. (4 marks)
- (b) Describe the **three** forms of asphaltic cut-backs. (6 marks)
- (c) (i) Outline the procedure for the standard compaction test on soils. (10 marks)
- (ii) With the aid of the density-moisture curve, explain the effect of using a higher compactive effort on soils. (10 marks)

7. (a) Explain **two** defects in rails on railways stating **one** cause for each. (6 marks)
- (b) (i) Define the term 'gauge' as used in railways.
- (ii) Explain **three** disadvantages of adopting different railway gauges in a region. (8 marks)
- (c) Explain **three** reasons for dredging. (6 marks)

80
70
6-4
5-4

12
33
24
5A
60
10
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8. (a) (i) Outline two purposes of road maintenance.
- (ii) Explain each of the following types of pavement failure:
- I. waves and corrugations;
 - II. shear failure. (7 marks)
- (b) Describe the mud-pumping phenomenon on cement-concrete roads. (5 marks)
- (c) State two factors that affect the cost of maintenance work. (2 marks)
- (d) Describe the evolution of road construction. (6 marks)

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