

2707/303

**BUILDING CONSTRUCTION III AND  
TRANSPORTATION ENGINEERING II**

June/July 2022

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.*

*The 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.*

*Candidates should answer the questions in English.*

**This paper consists of 4 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.

- Q-1. (a) State five advantages of applying finishes on timber floors. (5 marks)
- (b) Describe the following parts of form work: (8 marks)
- (i) props;  
(ii) joists;  
(iii) wedges.
- (c) With the aid of a labelled longitudinal cross-sectional sketch, outline the procedure of laying a granolithic floor finish on a concrete slab. (9 marks)
- Q-2. (a) Sketch each of the following parts of a stair: (6 marks)
- (i) nosing;  
(ii) step;  
(iii) headroom.
- (b) State four functional requirements of mill panels. (4 marks)
- (c) Explain each of the following methods of demolition: (4 marks)
- (i) wire rope pulling;  
(ii) thermic lance.
- (d) Sketch and label a vertical section through a needle and pile underpinning. (6 marks)
- (a) Differentiate between gantry and putlog scaffold. (4 marks)
- (b) Sketch and label the following foundation connection details of portal frames: (10 marks)
- (i) concrete pocket;  
(ii) steel hinged.
- (c) Explain each of the following terms relating to windows: (6 marks)
- (i) glazing;  
(ii) schedule;  
(iii) furniture.

Describe the function of the following elements of road furniture:

- (i) marker posts;
- (ii) safety fences.

(6 marks)

With the aid of a sketch, explain the reason for balancing 'cuts and fills' in earthworks.

(7 marks)

A 6.00 m wide road is to be regravelled using a 75 mm thick layer. The density of the material is 1350 kg/m<sup>3</sup> while 7 tonnes trucks are to be used. Determine the dumping interval of the material to the nearest 0.5 m.

(7 marks)

State three requirements of rails used in railway tracks.

(6 marks)

Differentiate the terms dredging and reclamation as used in construction.

(6 marks)

Outline three factors that affect dredging works.

Describe the evolution of road construction methods.

(8 marks)

State two sources of funds for labour based road construction.

Answer at least TWO questions from this section

SECTION B: TRANSPORTATION ENGINEERING II

Outline the procedure of erecting a raking shore.

(5 marks)

Sketch and label the detail showing the top and bottom of an industrial sliding door.

(7 marks)

State four reasons for providing suspended ceiling in residential buildings.

(4 marks)

State four reasons for providing kitchen fittings.

(4 marks)

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7. (a) Explain three reasons for road maintenance. (6 marks)
- (b) With the aid of sketches, differentiate between flexible and rigid pavements in terms of a localized failure in the subgrade. (8 marks)
- (c) Describe the following highway failures:
- (i) cracking;
  - (ii) waves and corrugations;
  - (iii) mud-pumping.
- (6 marks)
8. (a) Differentiate between disturbed and undisturbed soil samples. (10 marks)
- (b) Describe three sources of a sample for road construction material. (10 marks)
- (i) Distinguish between the terms improvement and stabilization as used in road construction.
- (ii) Explain two methods of stabilizing pavement construction material. (10 marks)