

2707/303
BUILDING CONSTRUCTION III AND
TRANSPORT ENGINEERING II
Oct./Nov. 2016
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;

Pocket 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 is as shown.

Candidates should answer the questions in English.

This paper consists of 5 printed pages.

Candidates should check the question paper to ensure that all pages are printed as indicated and no questions are missing.

SECTION A: BUILDING CONSTRUCTION

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

1. (a) Outline **three** methods of fixing precast concrete portal frames to foundation bases. (9 marks)
- (b) State **four** advantages of using precast concrete portal frames over traditional insitu concrete. (4 marks)
- (c) **Figure 1** shows a single line sketch of a reinforced concrete portal frame.
 - (i) Sketch section A to show a splice joint connection.
 - (ii) Sketch detail B to incorporate the following:
 - (I) precast concrete gutter;
 - (II) precast concrete purlins;
 - (III) asbestos roofing sheet;
 - (IV) a suitable joint between the supporting and spanning member. (7 marks)

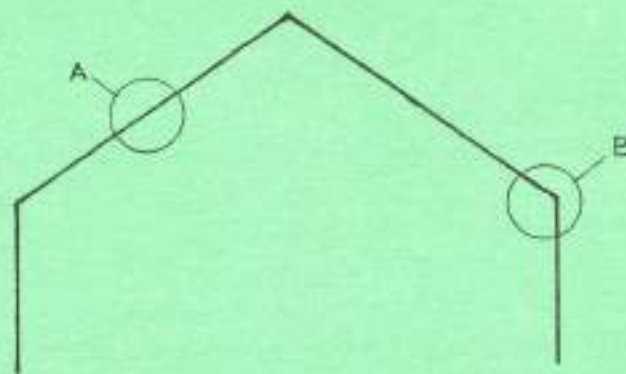


Fig. 1

2. (a) State the Kenya building code requirement for the following:
 - (i) height of stairs;
 - (ii) tread of stairs;
 - (iii) width of landing;
 - (iv) headroom. (4 marks)
- (b) Sketch the details to show how metal standards are fixed to concrete staircase and timber handrail. (3 marks)
- (c) State any **six** design requirements of a good form work. (3 marks)
- (d) With the aid of sketches, differentiate between putlog and independent scaffolds. (10 marks)

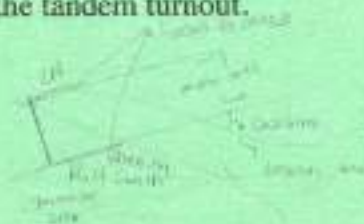
Handwritten notes:
 57
 2/7/10
 4/10
 10/10
 THE ROAD OF
 JERUSALEM
 TEMPORARY
 Formwork
 Level of construction
 • 200 x 200 mm x 200 mm
 • 100 x 100 mm x 100 mm
 • 50 x 50 mm x 50 mm

- (a) Sketch and label the following shoring systems: (8 marks)
- (i) dead shoring;
 - (ii) flying shoring.
- (b) Explain the objective of underpinning a foundation. (2 marks)
- (c) Sketch and show the details of ordinary underpinned foundation. (5 marks)
- (d) Explain the following demolition methods: (5 marks)
- (i) deliberate collapse method;
 - (ii) the ball technique method.
- (a) State any six factors governing the selection of finishes to floors. (6 marks)
- (b) Briefly describe the composition of the following floor finishes: (4 marks)
- (i) terrazzo;
 - (ii) grano.
- (c) State any six functions of dividing strips in terrazzo floor finish. (6 marks)
- (d) State four advantages of using curtain walls. (4 marks)

SECTION B: TRANSPORT ENGINEERING

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

5. (a) (i) Describe each of the following as applied to airport construction:
- (I) apron;
(II) runway. (4 marks)
- (ii) State **two** functions of the following airport furniture:
- (I) airport beacon;
(II) wind cone. (4 marks)
- (b) Briefly describe **three** methods of soil stabilisation. (6 marks)
- (c) With the aid of a sketch, describe the following compaction plants:
- (i) sheeps foot roller;
(ii) pneumatic roller. (6 marks)
6. (a) (i) Differentiate between 'Dredging' and 'Reclamation' stating **two** reasons for each. (6 marks)
- (ii) State **two** methods of pretreatment in a dredging process. (3 marks)
- (b) (i) Outline any **two** types of road maintenance methods. (3 marks)
- (ii) Briefly describe the term surface dressing stating its **three** functions. (5 marks)
- (c) State **three** sources of funding labour based work. (3 marks)
7. (a) State **two** functions of each of the following railway track components:
- (i) rail;
(ii) sleepers;
(iii) ballast. (6 marks)
- (b) With the aid of a sketch describe the tandem turnout. (4 marks)



* (c) State any:

- (i) **four** factors that affect designs of earthwork cuttings;
- (ii) **four** prevention of slips within earthwork cuttings.

(4 marks)

(d) Describe the procedure of field density sand replacement method.

(6 marks)

8. (a) (i) State **two** merits and **two** demerits of labour based construction.

(ii) Briefly describe the labour based method of surface dressing of a road.

(8 marks)

(b) With the aid of a sketch, describe the softening point test of a straight run bitumen.

(6 marks)

(c) State the function of each of the following in pavements:

- (i) base course;
- (ii) road base.

(3 marks)

(d) Sketch and label a rigid pavement.

(3 marks)



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