

To scan

2306/303
BUILDING CONSTRUCTION, CIVIL
ENGINEERING CONSTRUCTION AND
DRAWING
Oct./Nov. 2018
Time: 3 hours



THE KENYA NATIONAL EXAMINATIONS COUNCIL

DIPLOMA IN QUANTITY SURVEYING

BUILDING CONSTRUCTION, CIVIL ENGINEERING CONSTRUCTION
AND DRAWING

3 hours

INSTRUCTIONS TO CANDIDATES

You should have the following for this examination:

Answer booklet;

Drawing instruments;

Drawing paper size A3.

This paper consists of EIGHT questions in THREE sections; A, B and C.

Answer FIVE questions; TWO questions from section A, TWO questions from section B and ONE question from section C.

Questions in section A and B are 15 marks each while questions in section C are 40 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

Answer **TWO** questions from this section.

1. (a) State **four** factors that ensure an efficient site layout. (4 marks)
- (b) Using a labelled sketch, show the freezing technique of ground water exclusion. (6 marks)
- (c) State **three** principles applied when damp proofing walls. (3 marks)
- (d) State **two** disadvantages of single roofs inclined to less than 10°. (2 marks)
2. (a) Figure I shows a sliding door. Sketch and label sectional detail A and B. (6 marks)

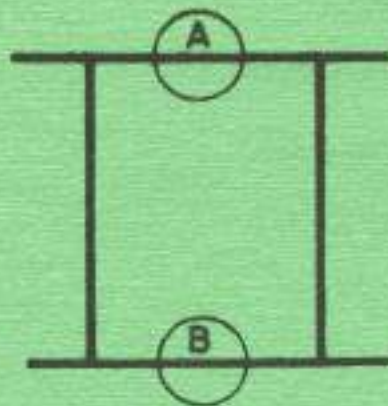


Fig.1

- (b) Explain the following defects in painting:
 - (i) running;
 - (ii) grinning;
 - (iii) sponification;
 - (iv) fading.(4 marks)
- (c) State **three** merits of air conditioning. (3 marks)
- (d) State **two** applications of retaining walls. (2 marks)

3. (a) **Figure 2** shows a line diagram of a multi-span factory roof. Sketch and label detail A. (3 marks)

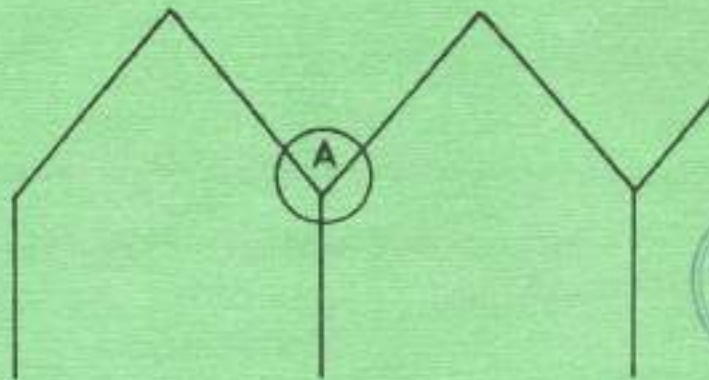


Fig.2

- (b) Outline **three** techniques of ensuring fire resistance in walls and columns. (3 marks)
- (c) Outline **three** principles of a good drainage system. (3 marks)
- (d) (i) Define the term 'shoring'.
(ii) Sketch and label a section through a vertical shore. (6 marks)

SECTION B: CIVIL ENGINEERING CONSTRUCTION

Answer TWO questions from this section.

4. (a) With the aid of a cross-sectional sketch, describe grillage foundation. (7 marks)
- (b) State **four** factors to consider when designing a concrete tunnel lining. (4 marks)
- (c) Differentiate between shallow and deep wells. (4 marks)
5. (a) Distinguish between active pressure and passive pressure as used in retaining wall. (4 marks)
- (b) State **three** reasons for erecting water front structures. (3 marks)
- (c) State **three** factors affecting selection of a dredging method. (3 marks)
- (d) With the aid of labelled sketches, describe a cess pool. (5 marks)

6. (a) Sketch and label the following pavement joints:
- (i) contraction;
 - (ii) warping;
 - (iii) expansion.
- (9 marks)
- (b) (i) Sketch and label a cross-section through a rectangular weir.
- (ii) Given that $h = 300$ mm, $b = 400$ mm, $g = 9.81$ and discharge constant is 1, calculate its flow rate.
- (6 marks)

SECTION C: DRAWING

Answer ONE question from this section.

7. (a) To a scale of 1:50, draw an isometric counter fort retaining wall using the following information:

Stem thickness	500 mm
Length of retaining wall	5000 mm
2 No. counter forts @ 1500 mm c/c	
Start of the first counterfort	1500 mm to edge
Thickness of counterfort	500 mm
Base slab thickness	600 mm
Height of stem	4000 mm
Counterfort projection from the top of stem	500 mm
Provide four main dimensions	

(30 marks)

- (b) Using the data given, draw to a scale of 1:10 a section through a rigid pavement.

DATA

Base layer	200 mm
Slip membrane	20 mm
Concrete slab	150 mm
Tapping	50 mm
Top mesh reinforcement cover	50 mm
Mesh termination from end	50 mm



(10 marks)

8. (a) To a scale of 1:25 draw a cross-section through a half turn precast staircase of a building using the following data.

Tread	250 mm
Riser	150 mm
Landing support beam	200 x 300 mm
Wall thickness	200 mm
Landing	1200 mm
Hard core thickness	250 mm
Floor slab thickness	150 mm
Floor to floor height	2700 mm
Flexible joint	50 mm
Blinding joint	50 mm
Bearing on landing support beam	100 mm

Assume any other relevant information.

(20 marks)

- (b) Using the data given, to a scale of 1:25 draw a cross-section through a vertical beam form work.

Sole plate	250 x 150 mm
Base plate	150 x 150 mm
Prop height	2000 mm
Head tree length	1200 mm (150 x 100 mm)
Braces 100 x 75 mm fixed to props at 1000 mm below the head tree	
Side and soffit boards	500 mm
Width of beam	500 mm
Joists	100 x 50 mm
Depth of beam	600 mm
Runners	100 x 100 mm
Blocking piece 100 x 100 mm at 50 mm from end of head tree	
Struts	50 x 75 mm
Floor decking	50 mm
Folding wedges	

Assume any other necessary information.

(20 marks)

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