Name _____ Index No. _____

2306/303
BUILDING CONSTRUCTION, CIVIL ENGINEERING CONSTRUCTION AND DRAWING
Oct./Nov. 2013
Time: 3 hours

Candidate's Signature _____

Date _____

THE KENYA NATIONAL EXAMINATIONS COUNCIL

DIPLOMA IN QUANTITY SURVEYING

BUILDING CONSTRUCTION, CIVIL ENGINEERING CONSTRUCTION AND DRAWING

3 hours

INSTRUCTIONS TO CANDIDATES

Write your name and index number in the spaces provided above.
Sign and write the date of the examination in the spaces provided above.
You should have drawing instruments and drawing paper size A2 for this examination.
*This paper consists of **EIGHT** questions in **THREE** sections **A**, **B** and **C**.*
*Answer **FIVE** questions choosing **TWO** questions from section **A**, **TWO** question from section **B** and **ONE** question from section **C** in the spaces provided in this question paper.*
*Questions in sections **A** and **B** carry 15 marks each while those in section **C** carry 40 marks each.*
Maximum mark for each part of a question are as shown.
*Do **NOT** remove any pages from this booklet.*
Candidates should answer the question in English.

For Examiner's Use Only

Section	Question	Maximum Score	Candidate's Score
A		15	
		15	
B		15	
		15	
C		40	
		Total Score	

This paper consists of 16 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

*Answer any **TWO** questions from this section.*

1. (a) (i) State **four** primary functions of a floor.

(ii) Using sketches explain **two** positions for placing a damp proof membrane when constructing solid ground floor (7 marks)

(b) (i) List **four** types of gypsum plaster boards

(ii) With aid of sketches explain the fixing and jointing of gypsum plaster boards. (8 marks)

2. (a) (i) State **four** reasons for carrying out soil investigation on a building site.

(ii) With the aid of a sketch explain the construction of a pad foundation (7 marks)

(b) (i) List **four** functional requirements of form work.

(ii) Sketch and label isometric view of beam form work. (8 marks)

3. (a) (i) Sketch the following types of stairs:

- quarter space landing stairs;
- dog leg stairs;
- open newel stairs.

(ii) Sketch and label double lap tiling details at the ridge. (10 marks)

(b) State **two** principles of fire place design. (2 marks)

(c) List **three** factors to be considered when designing a retaining wall. (3 marks)

SECTION B: CIVIL ENGINEERING CONSTRUCTION

Answer TWO questions from this section.

4. (a) (i) State **four** requirements of an ideal rail.

(ii) With the aid of a labelled sketch explain the construction of the following rail components:

- chairs;
- fish plate. (8 marks)

(b) (i) List **four** factors that influence the choice of a dam site.

(ii) Using a sketch, explain the construction of a wet intake tower. (7 marks)

5. (a) (i) State **four** reasons for providing joints in rigid pavements.

(ii) Explain the following defects in flexible pavements stating **two** possible causes for each:

- alligator cracks;
- rutting;
- pot holes. (11 marks)

(b) Using a sketch, explain how sand islands are used for sinking caissons. (4 marks)

6. (a) Describe the following waste stablization ponds:

- facultative ponds;
- maturation ponds. (6 marks)

(b) With the aid of a sketch explain the construction and operation of a septic tank. (9 marks)

SECTION C: BUILDING AND CIVIL ENGINEERING DRAWING

*Answer **ONE** question from this section.*

7. (a) To a scale of 1:200 draw a cross-section through an Earth fill dam.

DATA

- Top width of the dam = 5.00 m
- Base width of clay core = 10.0 m
- Upstream slopes = $1\frac{1}{2}$: 1
- Downstream slope = 1: 1
- Height of dam = 21.0 m
- Free Board = 2.40 m
- 600 mm thick stone pitching hand placed on 400 mm thick compacted gravel sand base on silt and clay upstream.
- Coarse sand and gravel to form support of the dam.

Assume any other relevant information. (20 marks)

(b) To a scale of 1:10 draw the vertical section of a T-shaped retaining wall.

DATA

- Top width of the stem = 200 mm
- Bottom width of the stem = 400 mm
- Height of stem above ground level = 2000 mm
- Height below ground level = 600 mm
- Width of heel slab = 1000 mm
- Thickness of heel slab = 300 mm
- Width of toe slab = 600 mm
- Thickness of toe slab = 300 mm
- Clear concrete cover = 50 mm
- Main reinforcement bars
  15 mm ϕ bar @ 200 c/c
- Distribution bars
  10 mm ϕ @ 120 c/c

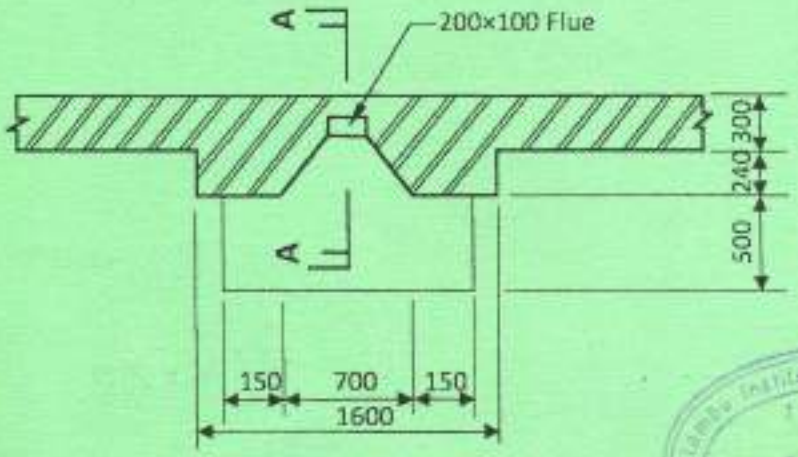
Assume any other relevant information. (20 marks)

8. Drawing No. 1 shows the plan of a fireplace in a kitchen wall.
To a scale of 1:10 draw setion A-A through the chimney stack.

DATA

- 150 mm thick R.C.C flat roof slab and 2.8 m above the kitchen floor.
- 100 mm thick back wall.
- 200 x 100 mm chimney flue
- 20 mm thick rebated flue liner to BS1251
- 100 X 150 mm R.C.C Lintol and 800 mm above kitchen floor
- 350 x 400 mm Chimney stack above roof level
- 80 mm thick chimney cover and 1.2 m above R.C.C. flat roof slab.
- Flue gathering of 60° above R.C.C. Lintol

Assume any other relevant information. (40 marks)



DRG No. 1