2707/203
CONSTRUCTION MANAGEMENT I, WORKSHOP
TECHNOLOGY AND WATER SUPPLY
June/July 2016
Time: 3 hours

THE KENYA NATIONAL EXAMINATIONS COUNCIL

DIPLOMA IN CIVIL ENGINEERING

CONSTRUCTION MANAGEMENT I, WORKSHOP TECHNOLOGY
AND WATER SUPPLY

3 hours

INSTRUCTIONS TO CANDIDATES

You should have the following for this examination:
    Answer booklet;
    Mathematical tables/Scientific calculator.
*This paper consists of **EIGHT** questions in **THREE** sections; **A**, **B** and **C**.*
*Answer **FIVE** questions choosing **THREE** questions from section **A**, **ONE** question from section **B** and **ONE** question from section **C**.*
All questions carry equal marks.
Maximum marks for each part of a question are as shown.
Candidates should answer the questions in English.

This paper consists of 4 printed pages.

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

     Turn over

SECTION A: CONSTRUCTION MANAGEMENT I

Answer any THREE questions from this section.

1.   (a)   State **four** functions of contract documentation.   (4 marks)

     (b)   Describe the following types of contractors:

       (i)   medium contractors;
       (ii)   speculative builders.   (8 marks)

     (c)   Explain **four** functions of construction management.   (8 marks)

2.   (a)   Sketch and label a typical site layout plan.   (10 marks)

     (b)   (i)   State **three** principles of a filing system
          (ii)   Describe **two** systems of filing documents.   (7 marks)

     (c)   Explain how breach of contract may result in its discharge.   (3 marks)

3.   (a)   State **four** objectives of management planning.   (4 marks)

     (b)   With aid of sketches explain the following organizational structures:

       (i)   Line and staff organizations;
       (ii)   Matrix organizations.   (12 marks)

     (c)   State **four** advantages of a joint venture.   (4 marks)

4.   (a)   Outline **five** causes of communication breakdown in organizations.   (10 marks)

     (b)   State **five** advantages of each of the following legal structures adopted by construction firms:
       (i)   partnerships;
       (ii)   limited companies.   (10 marks)

SECTION B: WORKSHOP TECHNOLOGY

Answer any ONE question from this section.

5.   (a)   State any **three**:

       (i)   types of consumer final circuits;
       (ii)   advantages of inter connected grid system;
       (iii)   purposes of a ring main in electrical distribution system.   (9 marks)

(b) Sketch a labelled diagram to show the path followed by the earth fault current in consumer appliances from the secondary of a transformer and back to it. (8 marks)

(c) A domestic single phase installation is supplied through a 60A H.R.C fuse with a fusing factor of 1.2. Calculate the maximum earth loop impedance to afford earth leakage protection. (3 marks)

6. (a) State **four** wring systems used in domestic installation. (4 marks)

(b) Sketch a labelled diagram to show how a final circuit supplying more than two lamps individually controlled is connected using twin sheathed cables and 3-terminal joint box (7 marks)

(c) Explain **three** factors that affect current rating of cables. (9 marks)

SECTION C: WATER SUPPLY

Answer any ONE question from this section.

7. (a) With aid of a sketch describe "the around the ends" baffle type mixing basin. (6 marks)

(b) State **four** factors considered in an ideal sedimentation basin. (4 marks)

(c) A rectangular plate of size 3 m x 5 m is immersed in water vertically in such a way that its 3 m side is parallel to the fee water surface and is 3 m below it. Determine the total pressure on one surface of the plate. (4 marks)

(d) A single acting reciprocating pump operating at 120 r.p.m. has a piston of diameter 200 mm and stroke of 300 mm. The suction and delivery heads are 4 m and 20 m respectively. If the efficiency of both suction and delivery strokes is 75 per cent, determine the power required by the pump. (6 marks)

8. (a) (i) Define precipitation.
(ii) List **six** precipitation losses. (4 marks)

(b) A vertical sluice gate 3 m wide and 2.5 m deep contains water on both of its sides. On the upstream side, the water is 5 m deep and on the downstream side it is 2 m deep from the bottom of the sluice. Calculate the resultant pressure on the gate. (8 marks)

(c)   A 300 x 150 mm venturimeter is provided in a vertical pipeline conveying oil of specific gravity 0.9, the flow being vertically upwards. The difference in elevation of the throat section and entrance section of the venturimeter is 300 mm.
The differential u-tube mercury manometer shows a gauge deflection of 250 mm.

Calculate
(i)   discharge of the oil and
(ii)   pressure difference between the entrance and the throat section.

Take the coefficient of the meter as 0.98 and the specific gravity of mercury as 13.6.

(8 marks)

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