

2707/203

CONSTRUCTION MANAGEMENT I,  
WORKSHOP TECHNOLOGY II AND  
WATER SUPPLY

June/ July 2019

Time: 3 hours



THE KENYA NATIONAL EXAMINATIONS COUNCIL

DIPLOMA IN CIVIL ENGINEERING

MODULE II

CONSTRUCTION MANAGEMENT I, WORKSHOP TECHNOLOGY II AND WATER SUPPLY

3 hours

#### INSTRUCTIONS TO CANDIDATES

*You should have the following for this examination:*

*answer booklet;*

*drawing instruments;*

*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.*

*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: CONSTRUCTION MANAGEMENT I

Answer **THREE** questions in this section.



1. (a) Explain each of the following terms used in the construction industry:
- (i) construction management;
  - (ii) light construction;
  - (iii) motivation;
  - (iv) contract.
- (8 marks)
- (b) Explain the **three** stages involved in a building construction project. (6 marks)
- (c) State **three** roles of each of the following stakeholders in the construction industry:
- (i) client;
  - (ii) site supervisor.
- (6 marks)
2. (a) Explain each of the following functions of management:
- (i) co-ordinating;
  - (ii) staffing;
  - (iii) communicating;
  - (iv) organising.
- (8 marks)
- (b) With the aid of a flow chart, explain each of the following types of organisational structures stating **two** advantages for each:
- (i) functional organisation;
  - (ii) line and staff organisation.
- (12 marks)
3. (a) Explain the term "site layout". (2 marks)
- (b) State six principles for the storage and stacking of materials on site. (6 marks)
- (c) Explain **four** filling systems used by construction firms. (8 marks)
- (d) Outline **two** mandatory documents for a valid contract. (4 marks)
4. (a) State **five** features of the construction industry. (5 marks)
- (b) Explain **five** methods of tendering. (10 marks)
- (c) Outline **five** circumstances that may render a contract null and void. (5 marks)

**SECTION B: WORKSHOP TECHNOLOGY II (ELECTRICAL)**

Answer *ONE* question from this section.

5. (a) Explain the generation of hydro-electric power. (2 marks)
- (b) State **four** advantages and **four** disadvantages of hydro-electric power. (8 marks)
- (c) With the aid of a sketch, state **five** components of an electric circuit. (10 marks)
6. (a) State **five** properties of PVC conduits. (5 marks)
- (b) Define the term 'conduit' and state its purpose. (3 marks)
- (c) **Figure 1** shows the arrangement of three resistors connected to a potential difference. Determine:
- (i) total resistance;
- (ii) current in each resistor;
- (iii) total current.

(12 marks)

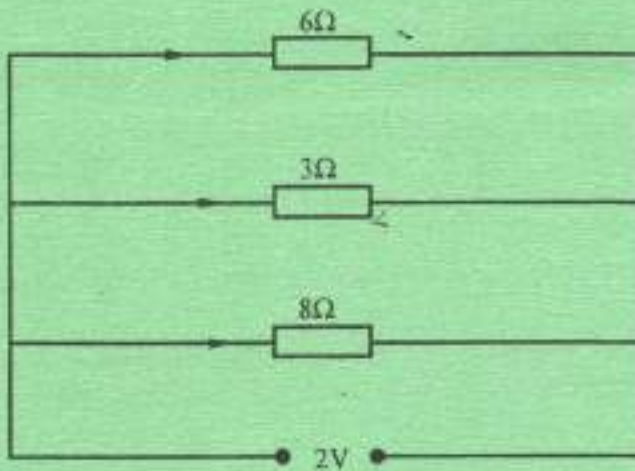


Fig. 1

$$R = \frac{VI}{A}$$

$$V = I$$

$$R_1 = 17.5 \Omega$$

$$17.5 \Omega$$

$$R_1 \Rightarrow R = \frac{VI}{A}$$

$$I = \frac{R}{V}$$

$$= \frac{6}{2}$$

$$R_2 = \frac{3}{2}$$

$$R_3 =$$



SECTION C: WATER SUPPLY

Answer **ONE** question from this section.

7. (a) A circular plate of 200 mm diameter is immersed vertically in an oil of specific gravity of 0.80 as shown in figure 2. Determine:
- (i) the oil pressure on the plate;
  - (ii) the position of the center of pressure on the plate.

(10 marks)

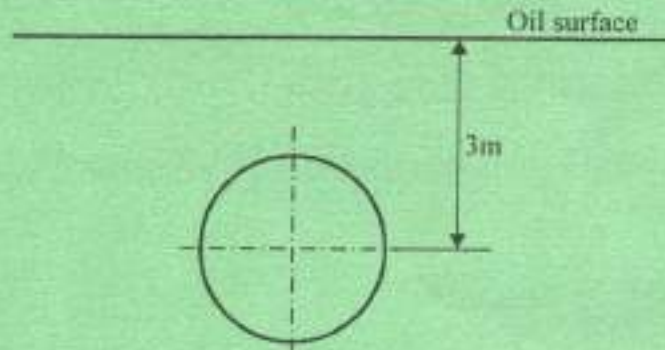


Fig. 2

- (b) State **three** differences between impulse turbine and reaction turbine. (6 marks)
  - (c) Define the term pump and state **four** types of pumps. (4 marks)
8. (a) State **four** components of a water supply system. (2 marks)
- (b) A 50 mm diameter orifice is discharging water under a head of 9 meters. Calculate:
- (i) the actual discharge through the orifice in litres;
  - (ii) the actual discharge of the jet in m/s at vena contracta.
- Take  $C_d = 0.625$ ,  $C_r = 0.98$  (10 marks)

(c)

- Explain **four** types of precipitation. (8 marks)



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