

2707/203
CONSTRUCTION MANAGEMENT I,
WORKSHOP TECHNOLOGY II
AND WATER SUPPLY
June/July 2021
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;

Mathematical tables/scientific calculator.

The 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 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.

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Turn over

SECTION A: CONSTRUCTION MANAGEMENT I

Answer **THREE** questions from this section.

1. (a) Explain **two** specialization comprising the scope of construction. (4 marks)
- (b) State **three** roles of Kenya Bureau of standards in the construction industry. (3 marks)
- (c) Explain **five** principles of management. (10 marks)
- (d) Define each of the following terms:
- (i) management;
 - (ii) organization. (3 marks)
2. (a) State **three** advantages of each of the following organizational structures:
- (i) military; (6 marks)
 - (ii) staff pattern. (6 marks)
- (b) Explain **three** methods of filing documents. (6 marks)
- (c) Explain **two** types of formal relationships in an organization. (4 marks)
- (d) State **four** reasons for a site layout plan. (4 marks)
3. (a) Outline **five** factors to consider in the design of a site layout plan. → (10 marks)
- (b) State **three** disadvantages of each of the following types of contracts:
- (i) Lumpsum; ✓
 - (ii) Cost plus percentage fee. (6 marks)
- (c) Differentiate between serial and negotiated methods of tendering. (4 marks)
4. (a) Explain **five** remedies to the 'breach of contract'. ⤵ (10 marks)
- (b) State **four** factors that render a contract null and void. † (4 marks)
- (c) Explain **three** requirements of a valid contract. (6 marks)

6
15
3
28
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41
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48
10
58

SECTION B: WORKSHOP TECHNOLOGY II (ELECTRICAL)

Answer *ONE* question from this section.

5. (a) Describe each of the following terms as used in electrical installation:
- (i) switch;
 - (ii) fuse;
 - (iii) earthing;
 - (iv) socket. (8 marks)

- (b) (i) With the aid of a labelled sketch, explain a two-way switch, showing a ceiling rose bulb, fuse and neutral link. (7 marks)
- (ii) State **one** example where switch in(i) may be used. (7 marks)
- (c) State **five** I.E.E regulations related to conductors and cables. (5 marks)

6. (a) State **three** electrical installation tests explaining the reason for carrying out each test. (6 marks)

- Polarity test
- Resistance to Wall and floor

- (b) State **four** advantages of metallic electrical conduits. (4 marks)

- Extension is easy
- Prevent the spread of fire
- Resistance to heat

- (c) Outline **four** advantages of mineral insulated metal sheathed (M.I.M.S) cable. (4 marks)

- Easy to work with

- (d) Explain **three** accidents that are likely to be experienced by electricians. (6 marks)

- Electric Shock - WI

Conductive

Participate

SECTION C: WATER SUPPLY

Answer ONE question from this section.

7. (a) Define each of the following properties of fluids:

- (i) viscosity;
- (ii) specific gravity;
- (iii) surface tension.

(6 marks)

(b) **Figure 1** shows a pipe conveying a steadily flowing fluid. The pipe tapers and branches into two. Calculate:

- (i) The discharges at C and D.
- (ii) The velocities at B and C.

Use the following data

Diameter at A 400 mm
Diameter at B 300 mm
Diameter at C 1150 mm
Diameter at D 200 mm
Velocity at A 1.5 m/s
Velocity at D 3.0 m/s.

$h_f = \frac{v^2}{2g}$
Entrance = $\frac{0.5v^2}{2g}$

(10 marks)

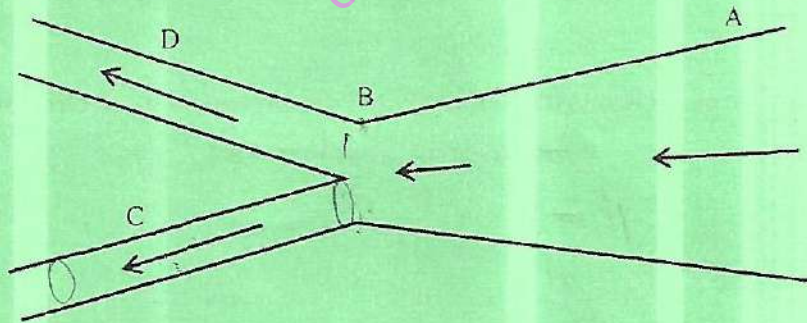


Fig. 1

(c) State two differences between impulse and reaction turbines.

(4 marks)

$$Q = \frac{A \cdot v}{2.9d}$$

8. (a) A river is approximately 12 m wide and 10 m deep. Three floats released upstream travelled 30 m in 28 seconds, 24 seconds and 30 seconds respectively. Calculate the discharge in litres per second given the correction factor is 0.75. (5 marks)
- (b) Explain each of the following stages of water treatment
- (i) Filtration;
 - (ii) Water softening;
 - (iii) Disinfection. (6 marks)
- (c) State **four** advantages of waste water stabilization pond. (4 marks)
- (d) With the aid of a labelled sketch, explain "hydrological cycle". (5 marks)

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