



2705/304 2709/304

2707/304 2710/304

**CONSTRUCTION MANAGEMENT II,
ESTIMATING AND COSTING II**

June/July 2018

Time: 3 hours

**THE KENYA NATIONAL EXAMINATIONS COUNCIL****DIPLOMA IN BUILDING CONSTRUCTION
DIPLOMA IN CIVIL ENGINEERING
DIPLOMA IN ARCHITECTURE****MODULE III****CONSTRUCTION MANAGEMENT II, ESTIMATING AND COSTING II****3 hours****INSTRUCTIONS TO CANDIDATES**

You should have the following for this examination:

Answer booklet;

Scientific calculator.

This paper consists of EIGHT questions in TWO sections; A and B.

Answer FIVE questions choosing TWO questions from section A, TWO questions from section B and another ONE question from either section.

All questions carry equal marks.

Maximum marks for each part of a question are indicated.

Candidates should answer the questions in English.

This paper consists of 6 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 II

Answer at least **TWO** questions from this section.

1. (a) (i) Outline **four** sources of law in Kenya. (10 marks)
- (ii) Differentiate between public law and private law giving **one** example in each case. (2 marks)
- (b) Briefly explain contributory negligence as applied in the law of tort. (8 marks)
- (c) (i) Define defamation. (6 marks)
- (ii) Highlight **three** defences in defamation. (1 mark)
- (iii) Distinguish slander from libel giving **three** distinctions. (8 marks)
2. (a) Explain **three** timing techniques using a stop watch in work measurement. (6 marks)
- (b) Table 1 shows a record of two cycles of time study for handling a matchboarded door size $900 \times 2100 \times 50$ mm thick.

Table 1

| Element No | Observed Rating (O.R.) | Observed Time (O.T.) (minutes) | Total Relaxation Allowance (%) |
|------------|------------------------|--------------------------------|--------------------------------|
| Cycle A | | | |
| 1 | 90 | 4.35 | 24 |
| 2 | 110 | 6.42 | 25 |
| 3 | 100 | 5.07 | 28 |
| 4 | 105 | 8.44 | 30 |
| 5 | 120 | 7.82 | 26 |
| Cycle B | | | |
| 1 | 95 | 4.59 | 24 |
| 2 | 100 | 5.98 | 25 |
| 3 | 105 | 5.65 | 28 |
| 4 | 110 | 8.60 | 30 |
| 5 | 100 | 8.00 | 26 |

If the contingency allowance is 2%, determine the standard time for the operation.

(14 marks)



- Basic line
BT=0.158
- 58 No in m²
- 1/0.158
- (a) Highlight **five** cases which may lead to misconduct and breach of discipline in construction industry. (5 marks)
- (b) Explain **three** leadership styles to be applied in construction industry citing an ideal situation for each. (6 marks)
- (c) Explain the following documentation used in material procurement process:
- invoice;
 - delivery note;
 - advice note.
- (6 marks)
- (d) Highlight **three** ways of improving security on a construction site. (3 marks)
4. (a) Outline **four** general defences to an action in tort. (6 marks)
- (b) The trial balance in **Table 2** was extracted from the books of Agano Enterprises at the close of business on 31st October 2011.

Table 2

| | Dr (Ksh) | Cr (Ksh) |
|-------------------------------|----------------|----------------|
| Stock 1 November 2010 | 29,700 | |
| Purchases | 112,800 | |
| Sales | | 197,400 |
| Salaries and wages | 31,800 | |
| Rent | 10,200 | |
| Insurance | 2,000 | |
| Van running expenses | 4,500 | |
| General expenses | 6,200 | |
| Office expenses | 5,000 | |
| Lighting and heating expenses | 1,500 | |
| Premises | 10,000 | |
| Motor vehicles | 1,800 | |
| Office furniture | 14,400 | |
| Debtors | 46,500 | |
| Creditors | | 24,900 |
| Cash at bank | 16,400 | |
| Drawings | 28,500 | |
| Capital | | 99,000 |
| | <u>321,300</u> | <u>321,300</u> |
| Stock at 31 October 2011 | 35,100 | |

$$ST = BS \times \left(\frac{100 \times All}{100} \right)$$

Draw up:

- Trading and profit and loss account for the year ended 31st October 2011.
- Balance sheet as at 31st October 2011. (14 marks)



SECTION B: ESTIMATING AND COSTING II

Answer at least **TWO** questions from this Section.

5. (a) The rates quoted in the bills of quantities for similar items by different contractors may not be the same. Justify this statement giving **five** reasons. (10 marks)
- (b) (i) State **six** factors to consider when pricing the items in the preliminary bill.
- (ii) Using the data given in **Table 3**, cost for a preliminary item "security officer" to be employed on site.

Table 3

| | |
|-------------------------------|------------|
| Basic salary per month | Ksh 20,000 |
| House allowance per month | Ksh 6,000 |
| Medial allowance per month | Ksh 4,000 |
| Transport allowance per month | Ksh 3,500 |
| Airtime allowance per day | Ksh 50 |
| Insurance per month | Ksh 2,000 |
| Contract period | 1½ years |
| Working days in a week | 6 |

Make reasonable assumptions for information not given.

(10 marks)

6. (a) Explain the term **front loading** as used in tendering. (2 marks)
- (b) Using the data given in **Table 4**, build up a unit rate for vibrated reinforced concrete (1:2:4) in 150 mm thick suspended slab (per m²).

Table 4

| | |
|---|------------------------|
| Skilled labour per hour | Ksh 75 |
| Unskilled labour per hour | Ksh 50 |
| Cost of cement per 50 kg bag | Ksh 730 |
| Cost of ballast per tonne | Ksh 1,500 |
| Cost of sand per tonne | Ksh 1,200 |
| Density of cement | 1440 kg/m ³ |
| Density of ballast | 1700 kg/m ³ |
| Density of sand | 1600 kg/m ³ |
| Hire rate of mixer and vibrator per day | Ksh 7,000 |
| Output of mixer per hour | 2.5 m ³ |
| Shrinkage of concrete | 50% |
| Working hour per day | 8 hours |

Materials cost as delivered to site.

Make assumptions for information not given.

(18 marks)

$$BT = DB \times DR$$

7. (a) Using declining balance method, determine the resale value of a back actor whose economic working life is 5 years and purchase price is Ksh 10,000,000, considering 25% rate of depreciation. (5 marks)
- (b) Using the data given in Table 5, build up a unit rate for 1 brick thick wall in English bond in cement sand mortar (1:3) (per m²).

Table 5

| | | |
|---|-------|------------------------|
| Skilled labour per hour | | Ksh 75 |
| Unskilled labour per hour | = ksh | Ksh 50 |
| Cost of the bricks per each | | Ksh 6 |
| Sand per tonne | = ksh | Ksh 1,300 |
| Bulking of sand | | 20% |
| Cement per 50 kg bag | | Ksh 730 |
| Density of cement | | 1440 kg/m ³ |
| Density of sand | | 1600 kg/m ³ |
| Shrinkage of mortar | final | 15% |
| Profits and overheads | | 20% |
| All in hire rate for 200 litre capacity mixer per day | | Ksh 4,500 |
| Cycle time of the mixer | | 4 minutes |
| Efficiency of the mixer | | 85% |

Allow 10 mm for mortar joints.

Cost of materials as delivered to site.

Make reasonable assumptions for information not given.

(15 marks)

$$a.d = \frac{\text{Purchase price} - \text{resale}}{\text{Life span}}$$





8. Using the data in **Table 6**, build up a unit rate for $152 \times 152 \times 16 \text{ mm}$ clay quarry tiled paving on 12 mm cement sand screed (1:3) bed (per m^2).

Table 6

| | |
|--|----------------------|
| Skilled labour per hour | Ksh 75 |
| Unskilled labour per hour | Ksh 50 |
| Sand per tonne | Ksh 1,300 |
| Bulking of sand | 20% |
| Cement per 50 kg bag | Ksh 730 |
| Density of cement | 1440 kg/m^3 |
| Density of sand | 1600 kg/m^3 |
| Shrinkage of mortar | 25% |
| $152 \times 152 \times 16 \text{ mm}$ quarry tiles per piece | Ksh 45 |
| Cost of mixer 300 litre capacity | Ksh 750,000 |
| Working hours per annum | 2000 hours |
| Salvage value | Ksh 150,000 |
| Maintenance and repairs | 30% of depreciation |
| Useful economic life | 5 years |
| Insurance | 2% of cost price |
| Interest on capital per annum | 12% |
| Transport to and from site per annum | Ksh 40,000 |
| Cycle time of mixer | 3 minute |
| Efficiency of the mixer | 90% |
| Diesel per litre | Ksh 110 |
| Fuel consumption per day | 10 litres |

Allow 6 mm for mortar joints.

Cost of materials as delivered to site.

Make reasonable assumptions for information not given.

(20 marks)

40.05 tiles

4"

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