2705/304
2707/304
2709/304
2710/304
CONSTRUCTION MANAGEMENT II,
ESTIMATING AND COSTING II
June/July 2020
Time: 3 hours

THE KENYA NATIONAL EXAMINATIONS COUNCIL

DIPLOMA IN BUILDING TECHNOLOGY
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 **THREE** questions from section **A** and **TWO** questions from section **B**.*
Maximum marks for each part of a question are as indicated.
Candidates should answer the questions in English.

This paper consists of 7 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

Job sequence or logic can be completely discred from time element
interrelationship of activities is clearly in c/n
Critical activities are clearly shown and can be altered easily

SECTION A : CONSTRUCTION MANAGEMENT II

*Answer **THREE** questions from this section.*

1. (a) State **three** comparisons between Critical Path Method (CPM) and Programme Evaluation Review Technique (PERT). (6 marks)

(b) State **five** roles of a junior engineer on a construction site. (5 marks)

(c) Explain **two** reasons for ensuring an efficient site layout. (4 marks)

(d) State **five** principles considered when storing and stocking of material on site. (5 marks)

2. (a) Explain **four** disadvantages of arbitration. (8 marks)

(b) Explain the following terms as applied in trespass.

(i) asault;
(ii) false imprisonment;
(iii) battery.

(6 marks)

(c) Explain **three** proofs of fault in the law of tort. (6 marks)

3. (a) An industrial concrete floor slab whose quantity in the bill of quantities is 15 m^3 is to be provided.

Using **table 1**, determine:

(i) number of 50 kg bags of cement;
(ii) quantity of sand (tonnes);
(iii) quantity of ballast (tonnes).

(12 marks)

Table 1

Mix proportion	1:1 $\frac{1}{2}$:3 (reinforced)
Density of sand	1600 kg/m^3
Density of ballast	1500 kg/m^3
Density of cement	1440 kg/m^3
Sand bulking	20%
Waste	4%
Yield of concrete (wet)	$\frac{2}{3}$ m^3

(b) Explain **two**

(i) demerits of externally sourcing of personnel.

(ii) methods of internal recruitment of personnel.

(8 marks)

4. (a) **Figure 1** shows part of an arrow network diagram for a construction project with a duration of 26 weeks.
Using data in **table 2**;

(i) Complete the arrow network diagram;
(ii) Determine the duration a and b for activities D and I respectively;
(iii) Show the critical path.
(iv) Analyse the latest start, finish and float times.

(14 marks)

Table 2

ACTIVITY	DURATION (WEEKS)	PREDECESSOR
A	4	-
B	5	A
C	3	A
D	a	B
E	4	C
F	6	C
G	8	B
H	2	F
I	b	E, D

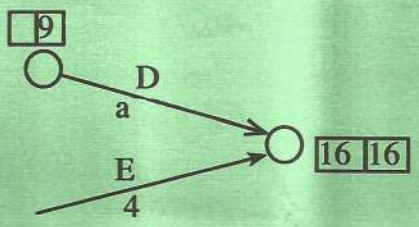

Figure 1

(b) Explain the following types of mortgages.

(i) english mortgage;
(ii) simple mortgage;
(iii) equitable mortgage.

(6 marks)

5. (a) The information in **table 3** relates to the credit sales made by Muke Wholesales to their customers during the month of February 2002. Prepare a sales day book starting with Folio number 10.

(10 marks)

Table 3

February	4	Peter Kshs 500, Karry Kshs 600, Mathew Kshs 700
	6	Mike Kshs 500, John Kshs 400
	10	Mark Kshs 650, Ruth Kshs 700
	15	Dianah Kshs 600, Peter Kshs 550
	25	Moses Kshs 850, Esther Kshs 200, Ronny Kshs 200

(b) **Table 4** shows a trial balance extracted from Foster builders. Prepare a trading, profit and loss account ending 30th April 2010.

(10 marks)

Table 4

Item	Dr	Cr
Premises	1,446,000	
Debtors and creditors	25,000	30,000
Cash at bank	20,000	
Cash at hand	90,000	
Purchases and sales	140,000	320,000
Opening stock	45,000	
Discounts	6,000	2,000
Salaries	50,000	
Commissions		8,000
Power and lighting	10,500	
Return	10,000	17,000
Carriage inward	5,400	
Carriage outward	2,300	
Capital		1,500,200
Furniture	27,000	
	1,877,200	1,877,200

Closing stock as at 30th April was Kshs 22,000.

SECTION B : ESTIMATING AND COSTING II

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

6. (a) Using the data in **table 5**, build up a unit rate for "(Cart away, deposit, spread and level excavated material (m^3)). (13 marks)

Table 5

Tipper cost	Kshs 5,000,000
Purchase price of tyre and tube	Kshs 30,000
Hire rate for grader	5,000
Tipping fee	4,000
Tipping distance	4 km
Life span of tipper	5 years
Scrap value	Ksh 450,000
Interest on capital	10% p.a
Insurance and taxes	75% of annual depreciation
Deposited volume	200 m^3
Working hours per year	2000
Tyres changed twice per year	
Tipper capacity	5 m^3
Efficience of tipper	80%
Tipper cycle	14 minutes
Skilled labour	Kshs 126 per hour
Unskilled	Kshs 60 per hour

Assume any other relevant information.

(b) State **four** variables that affect the cost of operating a mechanical plant. (4 marks)

(c) State **three** factors that influence the output of a mechanical plant. (3 marks)

- life span of the plant
- Type of plant
- Cost
- Site conditi
- Nature of work
- X-tics of equipme

7. (a) Build up a unit rate for the following item "1 brick thick wall in stretcher bedded and jointed in cement / sand mortar 1:4 (m^2)". Using the following data.

Data

Cost of bricks	Kshs 15 per brick
Cost of cement	Kshs 750 per 50 kg bag
Skilled labour	Kshs 126 per hour
Unskilled labour	Kshs 60 per hour
Density of sand	1600 kg/m^3
Density of cement	1440 kg/m^3
Brick size	215 x 102.5 x 65 mm

Assume any other necessary information.

(14 marks)

(b) Build up a unit rate for the following item "3 coats of plastic emulsion paint on plastered surface". using the following data.

(6 marks)

Data

Primer	Kshs 1200 per 4L tin
Undercoat	Kshs 1300 per 4L tin
Finishing coat	Kshs 1400 per 4L tin
Skilled labour	Kshs 126 per hour
Unskilled labour	Kshs 60 per hour

Coverage areas are; primer 10 m^2, undercoat 12 m^2 and finishing coat 14 m^2 for a 4 L tin.

Assuming any other necessary information.

8. (a) Build up a unit rate for the following item "405 x 235 x 15 mm clay interlocking tiles laid on 50 x 50 mm cypress battens with 75 mm end laps and 65 mm side laps (m^2)". Using the following data. (7 marks)

Data

Cost of tiles	Kshs 20,000 per 1000 batch
Nails	Kshs 150 per kg
Battens	Kshs 50 per metre
Skilled labour	Kshs 126 per hour
Unskilled	Kshs 60 per hour

(b) Build up a unit rate for making and fixing in position a soft wood framed ledged, braced and battened door.
Using the following data. (13 marks)

Data

Door size	1000 x 2100 x 50 mm thick
Stiles and top rail	100 x 50 mm
Middle rail and bottom rail	225 x 32 mm
Braces	100 x 32 mm
T & G battens	75 x 18 mm
Cost of sawn softwood	Kshs 10,000 per m^3 (Transport inclusive)
Cost of wood glue	Kshs 100 per kg
Cost of sand paper	Kshs 5 each
Cost of planning	Kshs 20 per hour
Skilled labour	Kshs 160 per hour
Cost of wedges	Kshs 10 each

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