



TECHNICAL UNIVERSITY OF MOMBASA

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FACULTY OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF BUILDING AND CIVIL ENGINEERING

DIPLOMA IN CIVIL ENGINEERING

EBC 2308: ESTIMATING AND COSTING

END OF SEMESTER EXAMINATION

SERIES –APRIL 2016

TIME: 2 HOURS

### INSTRUCTIONS TO CANDIDATES

You should have the following for this examination

- Answer booklet

This paper consists of **FIVE** questions

Answer any **THREE** questions

Maximum marks for each part of a question are as shown

This paper consists of **FOUR** printed papers.



## QUESTION ONE

- a) Briefly describe the following terms
- i) Labour constants
  - ii) Preliminary items
  - iii) All-in labour rates
- (4marks)
- b) Using the data given below build up a unit rate for concrete block walling in cement sand mortar mix 1:3 (per m<sup>2</sup>).

Data

Blocks size 200x200x400mm @ ksh 100

Sand 1 tonne @ ksh 1500

Cement 50kg bag @ ksh 700

Density cement 1440kg/m<sup>3</sup>

Density sand 1500kg/m<sup>3</sup>

Assume any other necessary information

(16marks)

## QUESTION TWO

- a) State six factors that affect the owning cost of a mechanical plant (3marks)
- b) Using hypothetical example price the following item, allow for disposal of general surface water from excavation (item) (7marks)
- c) A proposed storied building has two basements floors size 25x20x4m and 6 upper floor size 20x20x3m calculate the approximate cost of this building using the storey enclosure method. I assume given that unit cost is ksh 10,000/m<sup>2</sup>. (10 marks)

## QUESTION THREE

Use the data given build up unit rate for vibrated reinforced concrete mix (1;2:4) in ground beams (per m<sup>3</sup>).

Cost of cement	ksh700/50kg bag
Cost of sand	ksh 1500/per tonne
Cost of aggregate	ksh 2500/per tonne
Density of cement	1440kg/m <sup>3</sup>
Density of sand	1600kg/m <sup>3</sup>
Density of aggregates	1600kg/m <sup>3</sup>
Purchase price of 200 litre mixer	Ksh 300,000
Interest on capital per annum	15% of initial cost
Hours worked in a year	20% of annual depreciation
Maintenance per annum	5% of initial cost



Taxes /licenses etc per annum	20% of annual depreciation
Fuel consumption	5 litres/hr @ 70kssh /litre
Lubricant	1 litre/day @400ksh /litre
Daily maintenance and greasing	ksh100 per day
Skilled labour	ksh 100/hr
Unskilled labour	ksh 50/hr
Cycle time	5 minutes
Efficiency	90%
Assume any other necessary information	<b>(20marks)</b>

#### QUESTION FOUR

Using hypothetic given build up a unit rate for the following preliminary items

- i) Site store
  - ii) Site water
  - iii) Watchman
  - iv) Insurance
  - v) Site temporary power supply
- (20marks)**

#### QUESTION FIVE

Using the data given build up a unit rate for the following item load and transport to deposit, spread and level per m<sup>3</sup> excavated soil.

Data	
Purchase price for 10 tonne upper	ksh 10, 000,00
Resale value after 8 years	ksh 1,000,000
Interest on capital	10% per annum
Maintenance and repair	25% of annual depreciation
Insurance	40% of annual depreciation
Hours changed in a year	2000 hrs
Tyres changed once a year	6 no tyres @ 40,000 each
Hire rate of grader	10,000 including per fuel per day 8 hours
Volume deposited	20,000m <sup>3</sup>
Capacity of tipper	15m <sup>3</sup>
Tipping fee	sh 25/m <sup>3</sup>
Distance to tip	10km
Speed when timber is empty	20km/h
Speed of timber when loaded	40km/h
Skilled labour	ksh100/hr
Unskilled labour	ksh 50/hr
Assume any other necessary information	<b>(20marks)</b>

