



TECHNICAL UNIVERSITY OF MOMBASA
**Faculty of Engineering &
Technology**

DEPARTMENT OF BUILDING & CIVIL ENGINEERING
DIPLOMA IN BUILDING & CIVIL ENGINEERING (DBCE)

EBC 2308: ESTIMATING & COSTING OF BUILDING & CIVIL WORKS

END OF SEMESTER EXAMINATION

SERIES: AUGUST 2014

TIME ALLOWED: 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

All questions carry equal marks

Maximum marks for each part of a question are as shown

Use neat, large and well labeled diagrams where required.

This paper consists of **FOUR** /printed pages

Question

a) Define the following terms as used in estimation and costing:

- (i) Preliminary items
- (ii) Unit rate
- (iii) Labour rate
- (iv) Cost planning
- (v) Cost control

(10 marks)

b) Using the data below cost the plunking and strutting item. Consider 10m

Cost of 150 x 25mm boards @ ksh 100 per m length

100 x 50mm @ ksh 130 per m length

Cost of wedge ksh 5 each

Nails ksh 120 per kg

Unskilled labour ksh 50 per hr

Skilled labour ksh 90 per hr

(10 marks)

Question Two

a) Using hypothetical figures, describe the following method of calculating depreciation of mechanical plant:

- (i) Straight line method
- (ii) Double the rate method

(10 marks)

- b) Using illustrations discuss the following design variables that affect the cost of a project:
- (i) Plan shape
 - (ii) Size of a project
- (10 marks)**

Question Three

Determine the unit rate for cart away, deposit spread and level excavated materials (per m³) assuming the use of owned tipper and using the data given below:

Data:

- Purchase price of tipper ksh 4.5million
 - Purchase price of one type and tube ksh 30,000/=
 - Hire rate of grader (for spreading) = ksh 15,000/=
 - Tipping fee = ksh 8000/=
 - Volume deposited = 144m³
 - Distance to tip from site = 4km
 - Resale value of tipper = 500,000/=
 - Drivers wages = ksh 90/= per hr
 - Turn bay = ksh 50/= per hr
 - Contract period = 5 years
 - Maintenance and repairs = 50% of annual depreciation
 - Interest on capital 10%
 - Full consumption 6 litres per hr
 - Fuel cost shs 95 per litre
 - Efficiency 90%
 - Overall cycle time including tipping 14 min
 - Overall speed 40km/hr
- (20 marks)**

Question Four

Using the data given below, build up unit rate for reinforced concrete (1: 1 ½ : 3) in beams per m³

(20 marks)

Data:

- | | |
|--------------------------------------------|------------------------------------|
| Cost of cement | – ksh 700 per 50kg bag |
| Cost of fine aggregates | – kshs 1400 per tonne |
| Cost of coarse aggregates | – kshs 1800 per tonne |
| Density of cement | – 1400kg/m ³ |
| Density of fine aggregates | – 1600 kg/m ³ |
| Density of coarse aggregates | – 1400kg/m ³ |
| - Purchase price of 250 litre mixer | - ksh 550,000/- |
| - Economic working life of the mixer | - 5 years |
| - Working hours per year | - 2000 hours |
| - Survalue | - 50,000/- |
| - Maintenance, repair, insurance and taxes | – 60% of annual depreciation |
| - Interest on capital | - 12% per year |
| - Fuel consumption | - 1 litre/hour @ shs 110 per litre |
| - Lubricating oil and grease | - shs 10.00 per hour |
| - Mixing cycle time | - 5 min |

- | | | |
|--------------------------|---|-----------|
| - Efficiency of mixer | - | 55min/hr |
| - Skilled labour wages | - | sh 90/hr |
| - Unskilled labour wages | - | shs 60/hr |

Assume straight line of depreciation any other information not provided.

Question Five

Build up a unit rate for the following bill item 200mm thick solid concrete block wall in cement sand (1:4) mortar/m². Use the data given below. **(20 marks)**

- | | | |
|---------------------|---|------------------------------|
| - Cost of block | - | sh 100/= including transport |
| - Cost of cement | - | shs 650/= per 50kg bag |
| - Cost of sand | - | shs 2285/m ³ |
| - Density of cement | - | 1440kg/m ³ |
| - Skilled labour | - | shs 80 per hr |
| - Unskilled labour | - | shs 45 per hr |

Assume any other information not provided.