



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

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

EBC 2312: ESTIMATION & COSTING OF BUILDING & CIVIL ENGINEERING  
WORKS

**END OF SEMESTER EXAMINATION**

SERIES: APRIL 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 of the **FIVE** questions

All questions carry equal marks  
Maximum marks for each part of a question are as shown  
This paper consists of **THREE** printed pages

### Question One

- a) Describe FIVE discrepancies found in billed rates as a source of cost information. **(10 marks)**
- b) Define the following terms as used in estimation and costing: **(10 marks)**
- (i) Cost planning
  - (ii) Labour rate
  - (iii) Cost plan
  - (iv) Unit rate
  - (v) Cost control **(10 marks)**

### Question Two

- a) Using illustrations discuss the following design variables that affect the cost of a project: **(10 marks)**
- (i) Plan shape
  - (ii) Size of a project
- b) The figure 1 below shows a proposed building with 3 basements floors and of storeys, each storey 3.0m The basement is 26mm wide by 52 long with height of 3.6m The main building is 20m wide by 46 m long. Using storey enclosure method, determine the unit cost if the project is approximated to cost 280million. **(10 marks)**

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### Question Three

- a) Define the following terms as used in estimating and costing of mechanical plants giving at least TWO examples: **(4 marks)**
- (i) Owing cost
  - (ii) Running cost
- b) A face shovel costed 4 million to purchase. It is intended that the shovel be used in a contract lasting 5 years and its cost at the end of this estimated to be kshs 800,000. It bucket capacity is  $2\text{m}^3$ . Using the information given below, determine the cost of excavating  $1\text{m}^3$  of materials as per the contract requirement:

**Data:**

- Assume straight line method of depreciation
- Interest on investment = 15%
- Maintenance, repairs, insurance and taxes = 60% of annual depreciation
- Fuel consumption = 15ltrs/hr @ ksh 100 per litre
- Operator wages shs 90/hr
- hours worked in a year = 2000
- Assume any information not given

**(16 marks)**

**Question Four**

Using the data given below, built up unit rate for reinforced concrete (1:2:4) in 100mm thick floor bed (per m<sup>3</sup>)

**Data:**

- Cost of cement = kshs 750 per 50kg bag
- Cost of sand = ksh 1400 per tonne
- Cost of ballast = kshs 1750 per tonne
- Density of cement = 1440 kg/m<sup>3</sup>
- Density of sand = 1600kg/m<sup>3</sup>
- Density of ballast = 1400kg/m<sup>3</sup>

Purchase price of 250 litre mixer	=	ksh 550,000
Economic working life of mixer	=	5 years
Working hours per year	=	2000
Salvage value	=	ksh 50,000
Maintenance, repairs, insurance and taxes	=	60% of annual depreciation
Interest on capital	=	12% per year
Fuel consumption	=	1 litre/hr @ 110.00 per litre
Lubricating oil and grease	=	10.00 per hour
Efficiency of a mixer	=	54min/hr
Mixing cycle time	=	6 min
Skilled labour wages	=	90/hr unskilled – 60/hr
Unskilled labour wages	=	ksh 60/hr

Assume straight line method of depreciation and any other information not provided. **(20 marks)**

**Question Five**

Build up a unit rate for the following bill item 200mm thick grade 1 coral block wall in C:S (1:4) mortar per m<sup>2</sup>

- Cost of blocks kshs 55 each

(Assume size of block 180 x 180 x 380 and 20mm thick joint)

- Take data provided in Question 4 above