



# THE MOMBASA POLYTECHNIC UNIVERSITY COLLEGE

(A Constituent College of Jkuat)

*Faculty of Engineering and Technology*

DEPARTMENT OF BUILDING AND CIVIL ENGINEERING

**DIPLOMA IN BUILDING & CIVIL ENGINEERING**

EBC 2324 : ESTIMATING & COSTING

**END OF SEMESTER EXAMINATION**

SERIES: AUGUST/SEPTEMBER 2011

**TIME: 2 HOURS**

**Instructions to Candidates:**

You should have the following for this examination

- *Answer booklet*

This paper consists of **FIVE** questions in **TWO** sections **A & B**

Answer question **ONE (COMPULSORY)** and any other **TWO** sections from section **B**

Maximum marks for each part of a question is as shown

This paper consists of **FOUR** printed pages

## SECTION A (COMPULSORY)

### Question 1 (40 marks)

- a) Briefly describe **FIVE** sources of cost information used in the pricing of construction work (15 marks)
- b) (i) List any **THREE** components that constitute the cost of one cubic meter of concrete quoted by a contractor (3 marks)
- (ii) Briefly explain what is meant by 'All-in-Labour' rate (2 marks)
- c) Describe the following methods used in approximate estimating
- (i) Functional unit valuation method
  - (ii) Cubic capacity method
  - (iii) Storey enclosure method
  - (iv) Approximate quantities method (20 marks)

## SECTION B (Attempt any TWO questions)

### Question 2 (20 marks)

A face shovel has a purchase price of Kshs. 10 million. It is intended to use the shovel in a contract lasting for six years and the resale value of the shovel at the end of this period is estimated to be Kshs. 3 million. Using the information given below, calculate the cost of excavating one cubic meter of material using this excavator (20 marks)

Data:

Bucket capacity=3m<sup>3</sup>

Cycle time = 5 minutes

Efficiency = 50 minutes per hour

Hours worked in a year = 1800 hours

Assume straight line method of depreciation

Interest on capital 10% per year

Maintenance and repair costs - 60% of the annual depreciation

Fuel consumption – 20 litres per hour at Kshs 110/= per litre

Operators pay = Kshs 100 per hour

Banksman wage = Kshs 50/= per hour

Assume any other information not given

### Question 3 (20 marks)

Using the data given below, build up a unit rate for vibrated reinforced concrete (1:2:4) in column bases (per m<sup>3</sup>) (20 marks)

Data:

- Cost of cement - Kshs 700/= per 50kg bag
- Cost of sand - Kshs2000/= per tone
- Cost of ballast - Kshs 3000/= per tone
- Density of cement - 1440kg/m<sup>3</sup>
- Density of sand - 1600kg /m<sup>3</sup>
- Density of ballast - 1700kg/m<sup>3</sup>
- Purchase price of 300 litre mixer - Kshs 250,000/=
- Resale value after 4 yers - Kshs 50,000/=
- Interest on capital - 15%
- Hours worked in a year - 1600hrs
- Maintenance and repairs - 70% of the annual depreciation
- Fuel consumption - 3 litres per hour at Kshs 1100/= per litre
- Skilled labour - Kshs100/= per hour
- Unskilled labour - Kshs 50/= per hour
- Mixing cycle - 4 minutes
- Efficiency - 56 minutes per hour
- Assume any other necessary information not given

**Question 4 (20 marks)**

Using the data given, build up a unit rate for 200mm coral stone wall bedded in cement sand mortar (1:3) (per m<sup>2</sup>) (20 marks)

Data:

- Cost of 200 x 200 x 400 mm coral stones = Kshs 70/- per piece
- Cost of cement - Kshs 700 per 50kg bag
- Cost of sand - Kshs 2000 per tone
- Density of cement - 1440 kg/m<sup>3</sup>
- Density of sand 1600kg/m<sup>3</sup>
- Skilled labour - Kshs 75/- per hour
- Unskilled labour - Kshs 37.50/- per hour
- Assume any other information not given

**Question 5 (20 marks)**

- a) Briefly explain the following terminologies used in pricing of construction work and state what constitutes them.
- (i) All-in labour rate
  - (ii) Labour constants (10 marks)
- b) Using the data given build up a unit rate for BRC mesh A142 including laps, bends tying wires and spacer blocks (per m<sup>2</sup>) (10 marks)

Data:

Cost of one roll of BRC mesh A 142 (2.1 x 45m) = Kshs 22,500

Cost of tying wires - Kshs 3,000 per roll

Cost of spacer blocks – Kshs 5/- each

Number of spacer blocks per m<sup>2</sup> – 3 pcs

Skilled labour – Kshs 100/- per hour

Unskilled labour – Kshs 50/- per hour

Assume any other information not given