



**THE MOMBASA POLYTECHNIC UNIVERSITY COLLEGE**

**(A Constituent College of JKUAT)**

(A Centre of Excellence)

# **Faculty of Engineering & Technology**

DEPARTMENT OF BUILDING & CIVIL ENGINEERING

**BRIDGING HIGHER DIPLOMA (BHD 11)**

EBC 2324: ESTIMATING AND COSTING

**SPECIAL/SUPPLEMENTARY EXAMINATION**

**SERIES: OCTOBER 2012**

**TIME: 2 HOURS**

**Instructions to Candidates:**

You should have the following for this examination

- *Answer Booklet*
- *Pocket Calculator*

This paper consists of **FIVE** questions.

Answer question **ONE (COMPULSORY)** and any other **TWO** questions

Maximum marks for each part of a question are as shown

This paper consists of **THREE** printed pages

**Question One (COMPULSORY - 30 Marks)**

- a) Describe the following methods of approximate estimating giving **TWO** merits and **TWO** demerits
- i) Superficial area method
  - ii) Cube method
  - iii) Approximate quantities **(15 marks)**
- b) (i) Define the term 'unit rate'  
(ii) Build up a unit rate for 430 x 330mm x 15mm thick interlocking clay tiles with 70mm end laps and 30mm side laps laid on 50 x 25mm battens at 360mm centres (per m<sup>2</sup>) **(15 marks)**

**Question Two (20 Marks)**

- a) Outline the following terms used in Building Economics:
- i) Cost plan
  - ii) Cost check
  - iii) Cost control
  - iv) Cost analysis **(8 marks)**
- b) Explain the effect of the following design variables on cost of a building:
- i) Plan shape
  - ii) Size of the structure
  - iii) Wall to floor area ratio
  - iv) Circulation area **(12 marks)**

**Question Three (20 Marks)**

Build up a unit rate for the following:

- i) Excavate oversite to remove top soil 150mm thick and deposit on site heaps 60m away. **(5 marks)**
- ii) Excavate foundation trenches commencing from stripped level and not exceeding 1.50m deep (m<sup>3</sup>) **(7 marks)**
- iii) Coral block walling 200mm thick in cement sand mortar mix 1:3 **(8 marks)**

**Question Four (20 Marks)**

- a) Describe the following methods of depreciation of a mechanical plant.
- i) Sum of Number of years method
  - ii) Straight line method **(10 marks)**
- b) Calculate the hourly owning rate of a mechanical plant using the following data.
- i) Initial cost of plant @ kshs 5,000,000
  - ii) Plant useful life – 5 years
  - iii) Plant scrap value @ kshs 1,000,000
  - iv) Insurance @ 5% of initial cost per annum
  - v) Interest @ 10% of initial cost per annum
  - vi) Maintenance cost @ 20% of annual depreciation

- vii) Tyres @ 5% of annual depreciation per year
- viii) Number of hours worked per year = 2000

Use straight line method of depreciation.

(10 marks)

### Question Five (20 Marks)

Build up a unit rate for the following:

- a) Hardcore in layers each not exceeding 150mm per m<sup>3</sup> (4 marks)
- b) Blinding to hardcore surfaces 25month (3 marks)
- c) Damp proof membrane (3 marks)
- d) B. R. C mesh A 142 including tying wires and cover blocks (4 marks)
- e) Differentiate between overheads and profits as used in the buildup of unit rates (6 marks)

### APPENDIX 'A'

#### General Information

Labour Skilled @ Kshs 50 per hour.

Unskilled Kshs 30 per hour

Materials – Cement @ Kshs 700/- per 50kg bag

Sand @ 1500 per m<sup>3</sup>

Aggregates @ 2500 per m<sup>3</sup>

Hardcore @ 2000 per m<sup>3</sup>

P. P. M @ 100 kshs/m<sup>3</sup>

Cement density = 1440 kg/m<sup>3</sup>

Sand density = 1500 kg/m<sup>3</sup>

Aggregate density = 1500kg/m<sup>3</sup>

The size 430 x 330 x 15 @ 50 ksh per piece

Battens 50 x 25mm @ kshs 50 per meter

Nails @ kshs 150 per kilogramme