



# THE MOMBASA POLYTECHNIC UNIVERSITY COLLEGE

(A Constituent College of JKUAT)  
*Faculty of Engineering and Technology*

DEPARTMENT OF BUILDING AND CIVIL ENGINEERING

**BRIDGING HIGHER DIPLOMA (BHD 11)**

EBC 2324: ESTIMATING & COSTING (ADVANCED)

**END OF SEMESTER EXAMINATION**

SERIES: DECEMBER 2011

**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)** from **SECTION A** and any other **TWO** questions from **SECTION B**

Maximum marks for each part of a question are clearly shown

This paper consists of **THREE** printed pages

*Use the data in Appendix 'A' in addition to the information given in the question for price build-up.  
Assume any other necessary information.*

## SECTION A (COMPULSORY)

### Question 1

- a) Indicate and briefly explain **FIVE** sources of waste of materials during construction and what steps are necessary to be taken to minimize such waste. (15 marks)
- b) Build up unit rates for the following item:-
- (i) Excavate over site to remove vegetable soil average 150mm thick and deposit on site in spoil heaps as directed. (5 marks)
  - (ii) Build up a unit rates for the following item:-  
Excavate Pit for column base not exceeding 1.50m deep (CM) (10 marks)
  - (iii) Calculate the output of a 0.75 CM capacity Back-actor excavating a trench in ordinary soil and loading directly onto Lorries, with a time cycle of 3 minutes. (10 marks)

## SECTION B (Answer any TWO questions from this section)

### Question 2

Build up a detailed hourly All-in labour rate for a skilled tradesman, using the following data. (20 marks)

- Working period 45 hours per week
- Overtime 5 hours during the week and 2 on Sunday
- Annual leave with pay 14 days per annum
- Basic daily wage Ksh. 700.0
- Gazette holidays 10 days per year
- Medical Benefits Ksh. 700.00
- Tools Allowance Ksh. 800.00 per year
- Trade Supervision Ksh. 15.00 per hour
- NSSF Contribution 5% of basic pay per month
- Assume 52 working weeks and that the workers will be accommodated on site.

### Question 3

Indicate and briefly explain **FIVE** factors which may affect the prices to be quoted for concrete works. (10 marks)

Build up unit rates for the following items:

**Reinforced concrete: 1:2:4 mix in foundation trench (250 mm thick.) [CM]** (10 marks)

### Question 4

- a) Give a brief outline of the following methods of approximate estimating stating the advantages and disadvantages of each method (12 marks)
- Superficial area method
  - Approximate quantities method

- Cube method
- b) Build up unit rates for the following items:  
 250mm thick bed of broken stone hardcore watered and rolled to receive Blinding (measured separately) (SM) (8 marks)

**Question 5**

- a) Differentiate between Overheads and Profit as used in the buildup of unit rates (10 marks)
- b) State **FIVE** items that constitute the ON-costs of a Construction firm (10 marks)

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**ADDITIONAL DATA FOR USE IN ESTIMATING AND COSTING**

All-in skilled labour rate per hour sh. 95.00  
 All-in skilled labour rate per hour sh. 85.00

**Labour constants**

Excavate top soil average 150mm deep per SM 0.35 hrs  
 Excavate foundation trench not exceeding 1.50m deep per CM 3.25hrs  
 Excavate pit for isolated base not exceeding 1.50m deep per CM 5.00hrs  
 Off loading cement in 50kg. Bags per ton 1.50 hrs  
 Mixing, transporting, placing and compacting concrete in foundation 250mm thick bed of hardcore 1.50 hrs

**Costs in Materials**

Cement in 50kg. Bags delivered to site sh. 800.00  
 Fine aggregate (sand) per ton delivered to site sh.1, 500.00  
 Ballast per ton delivered to site sh. 2,100.00  
 Broken stone hardcore per 7 ton lorry delivered to site sh. 4,500.00

Density of cement 1442kg/cm  
 Density of Sand 1600kg/cm  
 Density of Ballast 1550kg/mm  
 Density of broken stone hardcore 2500kg/cm

Waste on concrete materials 10%  
 Shrinkage and voids in concrete 45%

Overheads and profit 25%