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

<u>**Instructions to Candidates:**</u>
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. (10 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. (5 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. 15,000.00 per year
- Tools Allowance   Ksh. 800.00 per month
- 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 a unit rate for the following item:

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)

…………………………….0………………………...

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%