THE MOMBASA POLYTECHNIC UNIVERSITY COLLEGE

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

DEPARTMENT OF BUILDING AND CIVIL ENGINEERING

HIGHER DIPLOMA IN BUILDING & CIVIL ENGINEERING

EBC 3204: ESTIMATING & COSTING

END OF SEMESTER EXAMINATION

SERIES: DECEMBER 2011

TIME: 2 HOURS

Instructions to Candidates:

You should have the following for this examination

- *Answer Booklet*

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

SECTION A (COMPULSORY)

Question 1 (30 marks)

a) Briefly describe the following methods of approximate estimating giving **TWO** merits and **TWO** demerits of each method.

(i) Functional unit valuation method
(ii) Cubic capacity method
(iii) Superficial area method (15 marks)

b) Briefly explain the following:
(i) Unit rate
(ii) Labour constant
(iii) All-in-Labour rate (6 marks)

c) Briefly explain any **THREE** sources of cost information (9 marks)

SECTION B (Answer any TWO questions from this section)

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 lasing for six years and the resale value of 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 materials using this excavator (20 marks)

Data

- Bucket capacity = $3m^3$
- 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 repairs = 60% of the annual depreciation
- Fuel consumption = 20 litres per hour at shs 110.00 per litre
- Operators pay = shs 100.00 per hour
- Banks man wage = shs 50.00 per hour
- Assume any other necessary information (20 marks)

Question 3 (20 marks)

a) Using the data given, build up a unit rate for making and fixing in position a softwood framed, ledged, braced and battened door size 800 x 2150mm consisting of 100 x 50 sticss and top 22 x 32mmmiddle and bottom rails, 100 x 32mm brace with 75 x 18mm tongued and grooved bottoms (per m^2) (13 marks)

b) Build up a unit rate for making and fixing in position a 75 x 100mm softwood rebated door frame for the door in 3 (a) (per m) (7 marks)

Data

Cost of 100 x 50mm wrot softwood - shs 70.00
Cost of 225 x 32mm wrot softwood -shs 50.00
Cost of 100 x 32mm wrot softwood - shs 30.00
Cost of 75 x 18mm wrot softwood - shs 20.00
Cost of 75 x 100mm wrot softwood - shs 80.00

Skilled labour - shs 100.00 per hour
Unskilled labour - shs 50.00 per hour
Assume any other necessary information

Question 4 (20 marks)

Using the data given, build up a unit rate for 200mm thick, solid concrete block wall bedded in cement mortar 1:3 (per m^2) (20 marks)

(8 marks)

Question 5 (20 marks)

Using the data given, build up a unit rate for reinforced concrete (1:2:4) in column bases (per m2)

Data (for question 4 and 5)

- Cost of cement - ksh 800.00 per 50kg bag
- Cost of sand - ksh 1400.00 per tonne
- Cost of bolest - ksh 15000.00 per tonne
- Density of cement - 1440kg/m^3
- Density of sand - 1500kg/m^3
- Density of ballast - 1400kg/m^3

Purchase price of 200 litre mixer - shs 400,00.00
Economic working life of mixer - 1750 hours
Maintenance and repairs - 30% of the annual depreciation
Efficiency of mixer - 85%
Salvage value of mixer - shs 50,000.00
Average interest per year - 26% of purchase of mixer
Insurance per year - shs 20,000.00
Diesel consumption of mixer per day - 20 litres at kshs 110.00 per litre
Mixer operator - shs 100.00 per hour
Mixer attendants - shs 50.00 per hour
Hire of poker vibrator including running costs - shs 4,000.00 per 8 hours a day
Cost of concrete blocks - shs. 80.00 per piece
Working hours per day - 8 hours
Assume any other necessary information