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=$3m^3$
       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 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^3) (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^3
Density of sand	- 1600kg /m^3
Density of ballast	– 1700kg/m^3
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^2)   (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^3
        Density of sand 1600kg/m^3
        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^2)   (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 m2 – 3 pcs
Skilled labour – Kshs 100/- per hour
Unskilled labour – Kshs 50/- per hour
Assume any other information not given