THE MOMBASA POLYTECHNIC UNIVERSITY COLLEGE

(A Constituent College of JKUAT)

(A Centre of Excellence)

Faculty of Engineering & Technology

DEPARTMENT OF BUILDING & CIVIL ENGINEERING

DIPLOMA IN CIVIL ENGINEERING (DCE 10B)

EBC 2310: ESTIMATING & COSTING OF CIVIL ENGINEERING WORKS

END OF SEMESTER EXAMINATION
SERIES: DECEMBER 2012
TIME: 3 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

a) Briefly explain the following:
- **(i)** Unit rate
- **(ii)** Labour constant
- **(iii)** All in labour rate
- **(iv)** All in machine rate. **(8 marks)**

b) Outline the following terms used in Estimating and Costing.
- **(i)** Building element
- **(ii)** Cost study
- **(iii)** Cost plan
- **(iv)** Cost analysis
- **(v)** Cost control **(5 marks)**

c) Describe how the following design variables affect the cost of a building.
- **(i)** Plan shape
- **(ii)** Size of the building
- **(iii)** Circulation area
- **(iv)** Services. **(8 marks)**

d) Outline the **FIVE** sources of cost information. **(9 marks)**

Question Two

a) Describe **FOUR** factors which make up:
- (i) Owning costs of a mechanical plant
- **(ii)** Running cost of a mechanical plant **(8 marks)**

b) Outline the following methods of plant depreciation:
- (i) Straight line method
- (ii) Sum of Number of years method **(7 marks)**

Question Three

Build up a unit rate for the following using the data given in Appendix 'A'.

a) Excavate pit for column bases commonly from ground level and hot exceeding 1.50m deep (per m^3) **(5 marks)**

b) Reinforced concrete mix 1:2:4 in foundations (per m^3). **(10 marks)**

Question Four

Build up a unit rate for the following using the data given in appendix 'A'.

a) 16mm ϕ High tensile steel bars including typing wires and cover blocks (per kg). **(5 marks)**

b) 200mm thick coral block walling in cement mortar mix 1:3 (per m^2). **(5 marks)**

c) Prepare and play one under coat and three finishing coats of gloss paint to timber general surfaces (per m^2). **(5 marks)**

Appendix 'A'

Mechanical plant

Cost of backactor Ksh. 5,000,000/-
Resale value after 5 years Ksh 500,000/-
Interest on Capital 10% per annum
Maintenance, repairs, insurance and Taxes @70% of annual depreciation.
Fuel consumption 10l/hr @ 100 ksh/litre
Operator @ Ksh 80/hr
Banksman @ Ksh 50/hr
Bucket Capacity = 0.5m3
Cycle time = 5 minutes
Efficiency = 85%
No of hours machine works per Annum = 1500 hours

Labour
Skilled labour @ ksh. 80/hr
Unskilled labour @ ksh. 50/hr

Materials
Cement 2 ksh. 700/50kg Bag
Sand @ 1000 ksh./Tonne
Aggregates @ 2000 ksh/Tonne
Cement Density = 1440kg/m3
Sand Density = 1500kg/m3
Aggregates Density = 1600kg/m3
ϕ
Reinforcements 16cm bars @ ksh. 2000/12m bar
Binding wire 2 ksh. 150/kg
Spacer blocks @ ksh. 10 each
Coral block size 400 x 200 x 200 2 ksh. 60 each
Under coat paint @ ksh. 200/ litre
Finishing gloss paint @ ksh. 300/litre

Assume any other necessary information