TECHNICAL UNIVERSITY OF MOMBASA

Faculty of Engineering & Technology

DEPARTMENT OF BUILDING & CIVIL ENGINEERING

DIPLOMA IN BUILDING & CIVIL ENGINEERING (DBCE)

EBC 2314: ESTIMATING & COSTING

SPECIAL/SUPPLEMENTARY EXAMINATION
SERIES: OCTOBER 2013
TIME ALLOWED: 2 HOURS

Instructions to Candidates:
You should have the following for this examination

- *Answer Booklet*
- *Pocket Calculator*

This paper consists of **FIVE** questions.
Answer any **THREE** questions
Maximum marks for each part of a question are as shown
This paper consists of **THREE** printed pages

Question One

a) (i) Define the term "unit rate"

(ii) Build up a unit for 420 x 330 x 15mm thick inter locking clay tiles with 70mm end laps and 30mm side laps laid on 50 x 25mm battens at 350mm centres (per m^2) **(15 marks)**

b) Describe the following methods of approximate estimating giving TWO merits and two demerits.
- **(i)** superficial area method
- **(ii)** cube method
- **(iii)** approximate quantities method **(15 marks)**

Question Two

a) Outline the following terms used in Building economics:
- **(i)** cost plan
- **(ii)** cost check
- **(iii)** cost control
- **(iv)** cost analysis **(8 marks)**

b) Explain how the following design variables affect the cost of a building.
- **(i)** plan shape
- **(ii)** size of the structure
- **(iii)** wall to floor area ratio
- **(iv)** circulation area **(12 marks)**

Question Three

a) Describe the following sources of cost information:
- **(i)** Published materials
- **(ii)** Price books
- **(iii)** Quotations
- **(iv)** Priced bills of quantities **(10 marks)**

b) Using assumptions build up the cost of the following preliminary works:
- **(i)** Site office
- **(ii)** Site foreman
- **(iii)** Water for works
- **(iv)** Site Telephone **(10 marks)**

Question Four

a) List **FOUR** roles of an estimator **(4 marks)**

b) Build up a unit rate for reinforced concrete mix 1:2:4 20mm aggregates in foundations given the following data.

Data:

$1m^3$ of cement	=	1440kg
$1m^3$ of sand	=	1500kg
$1m^3$ of aggregate	=	1500kg
50kg bag of cement @ 700ksh		
1 Tonne of sand @ 1200 ksh		
1 Tonne of Aggregate @ 2000 ksh		
0.20m3 mixer costs @ ksh 500,000		
Life span of mixer	=	4 years
Mixer salvage value	=	ksh 100,000
Interest on investment	=	10% per annum
Working hours in a year	=	2000 hours
Maintenance and repairs	=	30% of annual depreciation
Insurance and other taxes	=	10% of annual depreciation per year
Cycle time of mixer	=	5 minutes
Number of operators	=	12 labours and 2 skilled
Labour rates skilled @ kshs 100/hr		
Use straight line method of depreciation		
Assume any other necessary information		**(16 marks)**

Question Five

a) Define the following terms:
- **(i)** All-in-labour rate
- **(ii)** All-in-machine rate **(3 marks)**

b) List any **SIX** factors affecting operating cost of a plant **(3 marks)**

c) Outline the sum of Number of years method of depreciation using a hypothetical example **(4 marks)**

d) Build up a unit rate for the following using the given data:
- **(i)** 16mm diameter mild steel bar including laps, bends tying wires and spacer blocks (per kilogram)
- **(ii)** 200mm thick solid concrete block walling in cement sand mortar mix 1:4 (per m^2)

(10 marks)

Data

Cost of 1 bar 16mm diameter (12m long)	= 2000ksh
Weight of one bar	= 20kg
Tying wire used @ 2kg per 50kgs of bars	
Tying wire cost	=150ksh/kg
Spacer blocks 1 Number per mrun @ ksh 10 per piece	
Labour skilled @ 100ksh/hr	
unskilled 50ksh/hr	
Blocks size 400 x 200 x 200	@ksh 100 each
Cement density	@1440kg/m^3
Sand density	@1500kg/m^3

Cement cost @700/50kg bag
Sand cost @ksh 1000/m^3
Assume any other necessary information