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

DIPLOMA IN ARCHITECTURE

EBC 2324: ESTIMATING & COSTING

SPECIAL/SUPPLEMENTARY EXAMINATION

SERIES: MAY/JUNE 2012

TIME: 2 HOURS

Instructions to Candidates:

You should have the following for this examination

- *Answer Booklet*
- *Pocket Calculator*

This paper consists of **FIVE** questions in **TWO** sections **I & II.**
Answer question **ONE** plus any other **TWO** questions
Maximum marks for each part of a question are clearly shown
This paper consists of **THREE** printed pages

SECTION I (Compulsory – 30 marks)

Question 1 (20 marks)

a) Outline **FIVE** objectives of bills of quantities (8 marks)

b) (i) Explain the purpose of the preliminary section of bills of quantities (3 marks)

(ii) Briefly explain **THREE** methods used in valuation of preliminary items giving one example and one disadvantages of each case. (9 marks)

c) Discuss the storey enclose method of approximate estimating and state **THREE** demerits of this method (12 marks)

d) Distinguish between 'Net Pricing' and 'Gross Pricing' and state one disadvantage of each method. (8 marks)

SECTION II (Answer any TWO questions)

Question 2 (20 marks)

A force shovel has a purpose price of kshs 10 million. It is intended to use the shovel in a contract lasting 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 metre of materials using the excavator.

Data		
Bucket capacity	=	3 m^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 kshs 110.00 per litre
Operators pay	=	kshs 100.00 per hour
Banksman wage	=	kshs 50.00 per hour
Assume only other necessary information		

Question 3 (20 marks)

Build up a unit rate for 250 mm thick hardcore filling deposited and compacted in layers not exceeding 150mm (per m^2) (20 marks)

Data

Hardcore per tonne	-	shs 900.00
Density of hardcore	-	2400kg/m^3
Purchase price of 8 tonne roller	-	shs 12,000,000

Selvage value after 6 years	-	shs 400,000
Economic working life of roller	-	6 years
Hours worked per	-	1500 hours
Interest on capital per annum	-	20% of purchase
Insurance per year	-	3% of purchase price
Maintenance and repairs	-	5% of annual depreciation
Diesel consumption of roller	-	150 litres per 8 hours day at kshs 110 per litre
Oil consumption of roller	-	150 litres per week at kshs 300 per litre
Haulage of roller to and from site per year	-	kshs 50,000

Question 4 (20 marks)

Using the data given, build up a unit rate for reinforced concrete (1:2:4) in foundations (per m^3)

Data

- Cost of cement - kshs 800.00 per 50kg bag
- Cost of sand - kshs 1400.00 per tonne
- Cost of ballast - kshs 1500.00 per tonne
- Density of cement - 1440 kg/m^3
- Density of sand - 1500 kg/m^3
- Density of ballast - 1400 kg/m^3
- Purchase price of 00 litres mixer - shs 400,000 /=
- Hours worked per year - 1500 hours
- Maintenance and repairs - 30% of the annual depreciation
- Efficiency of mixer - 85%
- Salvage value of mixer - kshs 50,000/=
- Average interest per year - 26% of purchase price of the mixer
- Insurance per year - ksh 20,000/=
- Diesel consumption per day - 20 litres at kshs 110/= per litre
- Mixer operator - kshs 100/- per hour
- Mixer attendants - kshs 50/= per hour
- Hire of poker vibrator including running cost - kshs 4,000/= per 8 hour day
- Working hours per day - 8 hours

Question 5 (20 marks)

Using the data given, build up a unit rate for 125 x 250 x 1200 mm precast concrete splayed road kerbs finished smooth and jointed in cement sand morter (1:3) and set on and including concrete (1:3:6) bed size 325 x 100 mm thick (per metre run) (20 marks)

Data

- 300mm diameter invert block drain Each (600mm long x 250mm high) - shs 1500/=
- Cost of cement per 50 kg bag - kshs 800/=
- Cost of sand per tonne - shs 3000/=
- Cost of murram (bed) - kshs 1000/= per m^3