



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 CIVIL ENGINEERING & CAD

EBC 2322: 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 (20 marks)

- a) (i) State **FIVE** factors that affect the operating costs of mechanical plant (2 ½ marks)
- (ii) Using hypothetical example price the following item. Allow for disposal of general surface water (item) (7 ½ marks)
- b) Briefly explain the following methods of approximate estimating giving **TWO** merits and **TWO** demerits of each method
- (i) Functional unit valuation method
- (ii) Cubic capacity method (10 marks)
- c) A proposed storey building has two basement floors size 20 x 20 x 4m and three upper floors size 15 x 15 x 3m. Calculate the approximate cost of this building using the storey enclosure method given that the unit cost is kshs. 6000.00 per m².

SECTION B (Answer any TWO questions from this section)

Question 2 (20 marks)

Using the data given, build up a unit rate for vibrated reinforced concrete (1:2:4) in ground beams (per m³)

Data

Cost of cement	– kshs. 700/- per 50kg bag
Cost of sand	- kshs 2000/- per tonne
Cost of ballast	- kshs 3000/- per tonne
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/=
Interest on capital	– 15%
Hours worked in a year	- 1600 hours
Maintenance and repairs	-70% of the annual depreciation
Fuel consumption	– 3 litres per hour at kshs 110/= per litres
Skilled labour	– kshs 100/= per hour
Unskilled labour	– kshs 5-/- per hour
Mixing time	– 4 minutes per cycle
Efficiency	- 56 minutes per hour

Assume any other necessary information not given

Question 3 (20 marks)

a) Briefly describe the following terms

- (i) Labour constants
- (ii) Pro-rata rates
- (iii) Preliminary items

(4 ½ marks)

b) Using the data given build up a unit rate for 265 x 165 x 15mm clay tiles laid on 50 x 25mm sown softwood battens and nailed at every fourth course with 32mm long mild steel nails (per m²)

(15 ½ marks)

Data

Cost of tiles	-	kshs 70/- per piece
Cost of 50 x 25mm sown softwood	-	ksh 40/= per m
Cost of 32mm long mild steel nails	-	kshs 80/= per kg
Unskilled labour	-	kshs 50/= per hour

Assume any other necessary information

Question 4 (20 marks)

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 2100 x 50mm consisting of 100 x 50mm stiles and top rail, 225 x 32mm middle and bottom rail, 100 x 32mm braces, 75 x 18mm T and G battens

(per m²)

(20 marks)

Data

Cost of sown softwood	-	kshs 8000/- per m ³
Cost of wood glue	-	kshs 200/= per kg
Cost of sand paper	-	ksh 10/- per piece
Cost of wedges	-	kshs 2/= each
Cost of planing	-	kshs 10/= per m for all sizes

Costs of materials are inclusive of transport costs

Skilled labour	-	shs 100/= per hour
Unskilled labour	-	shs 50/- per hour

Assume any other necessary information

Question 5 (20 marks)

Using the data given, build up a unit rate for the following item, cart away deposit spread and level' (per m³)

(20 marks)

Data

Purchase price for 12 tonne tipper	-	kshs 10,000,000/-
Resale value after 5 years	-	kshs 2,000,000/-
Interest on capital	-	10% per annum (year)
Maintenance, repairs and insurance	-	70% of the annual depreciation
Fuel consumption	-	10 litres per hour at kshs 110/- per litre
Hours worked in a year	-	1500 hours
Hire rate for grader	-	kshs 200,000/= including the operator
Tyres changed twice per year for the tipper	-	

Cost of one tyre of tipper	-	shs 60,000/- each
Volume deposited	-	50,000m ³
Capacity of tipper	-	15m ³ per trip
Tipping fee	-	shs 5/- per m ³
Distance to tip	-	10 km
Speed when tipper is fully loaded	-	20 km/hour
Speed when tipper is empty	-	40km/hour
Skilled labour	-	kshs 100/- per hour
Unskilled labour	-	kshs 50/= per hour
Assume any other necessary information not given		