THE MOMBASA POLYTECHNIC UNIVERSITY COLLEGE

Faculty of Engineering

DEPARTMENT OF BUILDING AND CIVIL ENGINEERING

DIPLOMA IN BUILDING

MEASUREMENT, ESTIMATING AND COSTING

END OF SEMESTER I EXAMINATION

SERIES: APRIL/MAY 2010

TIME: 3 HOURS

Instructions to Candidates:

You should have the following for this examination:
- Answer Booklet
- Pocket Calculator
- Dimension papers
- A copy of the Standard Method of Measurement of Building Works (SMM)

This paper consists of **SIX** questions in **TWO** sections **A** and **B**.

Answer any **TWO** questions from each Section.

Question in Section **A** carry 30 marks each while those in Section **B** carry 20 marks each.

Maximum marks for part of question are as shown.

SECTION A: MEASUREMENT

(Answer any **TWO** questions from this Section.)

Q.1 Take off **all** quantities for the Substructure works shown in drawing No.01A. (30 marks)

Q.2 Drawing no.02 shows the plan layout of superstructure walls and a schedule of finishes for an office block. Take off all the quantities for:-

(a) The superstructure walls up to the roof. (15 marks)

(b) All the floor, wall and ceiling finishes, including painting and decorating. (15 marks)

Q.3 (a) Explain the **FOUR** stages of bill preparation using the Traditional method. (15 marks)

(b) Give **FIVE** differences between Building and Civil Engineering Quantities with a brief explanation of each. (15 marks)

SECTION B: ESTIMATING AND COSTING

(Answer any **TWO** questions from this Section)

Use the information in Appendix 'A' for price build-up. Assume any other necessary information.

Q.4 (a) Indicate and briefly explain **FIVE** sources of waste of materials during construction and what steps are necessary to be taken to minimize such waste. (10 marks)

(b) Build up unit rates for the following items:-

Excavate over site to remove vegetable soil average 150mm thick and deposit on site in spoil heaps as directed. [SM] (10 marks)

Q.5 (a) Build up a detailed hourly All – in – labour rate for a skilled tradesman, using the following data. (16 marks)

- Working period 45 hours per week
- Overtime 3 hours per week on Saturday
- Annual leave 24 days per year
- Sick leave 14 days per year
- Basic hourly wage Ksh.50.00 per hour
- Gazetted holidays 11 No. per year
- Medical benefits Ksh.15000.00 per year
- Trade Supervision Ksh.10.00 per hour
- NSSF Contribution 5% of basic pay per month
- Assume 52 working weeks and that the workers will be accommodated on site.

(b) Explain the term Operating costs for an item of plant giving examples of **TWO** of such costs. (4 marks)

Q.6 (a) Differentiate between Overheads and Profit as used in the build up of unit rates. (8 marks)

(b) State **SIX** items that contribute to the Overheads costs of a Construction firm. (12 marks)

DATA FOR USE IN ESTIMATING AND COSTING

All-in Skilled labour rate per hour	sh.90.00
All-in unskilled labour rate per hour	sh.80.00

Labour constants:

Excavate top soil average 150mm deep per SM	0.35 hrs
Excavate to reduce levels average 150mm deep per SM	0.45 hrs
Excavate to reduce levels average 200mm deep per CM	2.40 hrs
Excavate foundation trench not exceeding 1.50m deep per CM	3.25 hrs
Excavate foundation trench exceeding 1.50m but not exceeding 3.00m deep per CM.	6.50 hrs
Excavate pit for isolated base not exceeding 1.50m deep per CM	5.00 hrs
Excavate pit for isolated base exceeding 1.50m but not exceeding 3.00m deep per CM	10.00 hrs
Offloading cement in 50 Kg. bags per ton	1.50 hrs
Mixing, transporting, placing and compacting concrete in foundation trenches not exceeding 150mm thick per CM	4.66 hrs
Mixing, transporting, placing and compacting concrete in foundation trenches 150-300mm thick per CM	4.33 hrs

Materials:

Cement in 50 Kg. bags delivered to site	sh.700.00
Fine aggregate (sand) per ton delivered to site	sh.800.00
Ballast per ton delivered to site	sh.1,800.00
Density of Cement	1442 Kg.
Density of Sand	1600 Kg.
Density of Ballast	1550 Kg.
Waste on concrete materials	10%
Shrinkage and voids in concrete	40%
Overheads and Profit	20%