



**MASINDE MULIRO UNIVERSITY OF
SCIENCE AND TECHNOLOGY
(MMUST)**

MAIN CAMPUS

UNIVERSITY EXAMINATIONS

2021/2022 ACADEMIC YEAR

3RD YEAR SEMESTER TWO MAIN EXAMINATIONS

**FOR THE DEGREE
OF
BACHELOR OF TECHNOLOGY IN BUILDING CONSTRUCTION**

**COURSE CODE: BTB 354
COURSE TITLE: CONSTRUCTION COST ESTIMATING &
ANALYSIS I**

DATE: WEDNESDAY 20TH APRIL 2022 TIME: 12:00 – 2:00 PM

INSTRUCTIONS:

1. This paper consists of **FOUR** questions.
2. **ANSWER QUESTION ONE (COMPULSORY) AND ANY OTHER TWO QUESTIONS.**
3. Marks for each question are indicated in the parenthesis.
4. **The examination is 2 hours.**

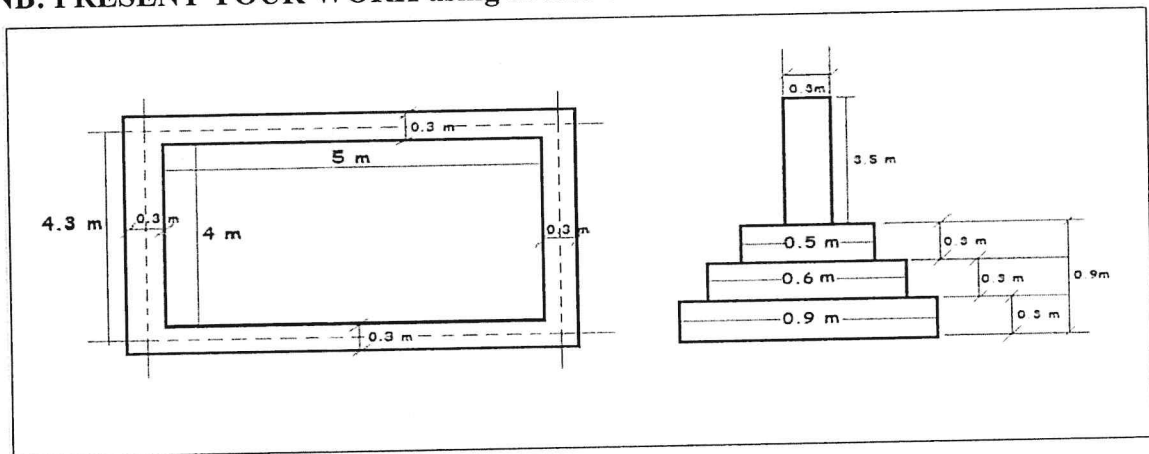
MMUST observes **ZERO** tolerance to examination cheating

This Paper Consists of 4 Printed Pages. Please Turn Over.

Question ONE (30 Marks)

- a) What is your understanding of estimating? Outline THREE requirements of an estimate. [4 Marks]
- b) Briefly explain FOUR reasons for estimation and costing. [4 Marks]
- c) Briefly describe work charge establishment, giving necessary examples. [2 Marks]
- d) Outline the factors that influence the value of a building. [5 Marks]
- e) What is a tender? Describe FOUR procedures to be followed for tender invitation. [5 Marks]
- f) The figure 1 provided is for a single room (load bearing type structure). The room has a single door of dimension 1x2.1 m and three windows measuring 1.5x1.2m each. Using the centre-line method of measurement of materials and works, determine: [10 Marks]
- The earthwork excavation
 - Plain cement concrete (PCC/CC) – 1:4:8 for the bed foundation
 - RR Masonry in cement mortar (1:6)
 - Brickwork in cement mortar (CM)

NB: PRESENT YOUR WORK using details of measurement form format.

**Question TWO (20 Marks)**

- a) Briefly explain FOUR factors that need to be considered while fixing rate per unit of an item. [6 Marks]
- b) Differentiate between the plinth area method and the cubical contents method of cost estimates. [2 Marks]
- c) Briefly outline the differences between centre-line method and long wall-short wall method of taking measurements. [2 Marks]
- d) Prepare the approximate cost of a building project using the following information: (i). No. of houses = 150, (ii). Plinth area of each dwelling = 600 m², (iii). Plinth area rate = Kshs. 1250 per m², (iv). Cost of water supply and sanitary arrangements @7.5% of building cost, (v). electrification @4% of building cost, (vi). Cost of roads and lawns @ 5% of building cost, (vii). Cost of P.S & contingencies @ 4% of the building cost. [7 Marks]
- e) An investor intends to establish an hospital within Lurambi ward. The hospital is expected to

have a capacity of 100 beds for in-patient services. The construction cost based on unit base method is estimated at Kshs. 90,000.00. Prepare an approximate cost of the hospital building using unit base method. [3 Marks]

Question THREE (20 marks)

- a) What is rates analysis? Outline the importance of rates analysis of a project. [2 Marks]
- b) Outline FOUR reasons that would necessitate undertaking the rate analysis of a project. [4 Marks]
- c) Differentiate between lead, lead statement and lift as used in rate analysis of earthwork materials. [3 Marks]
- d) Calculate the unit rate of a 10m³ of concrete class M25 with a mix ratio of ingredients 1:1:2. Use the following additional information for your analysis:
 Density of cement = 1440 kg/m³
 Density of steel reinforcement = 7850 kg/m³
 Assume a factor of 0.52 for dry volume of concrete.
 1.5% of steel has been used in the concrete
 Cost of water for concrete mix = 1.5 % of the total cost of concrete.
 Contractor charges = 15% of the total cost

Table of rate analysis for concrete

Particular	Unit	quantity	Rate (Kshs.)
Materials			
Ballast	M ³		3000 per M ³
sand	M ³		2400 per M ³
cement	Bags		600 per bag
steel	Kg		150 per Kg
binding wires	Kg	1.5	150 per kg
Manpower			
foreman	no.	1	1100
mason	no.	3	800
unskilled labourers	no	12	500
steel fixers	no.	3	600
carpenters	no	3	800
shuttering timber and plank	lumpsum		10,000

[11 Marks]

Question FOUR (20 marks)

- a) Outline FOUR essential requirements of a contract. **[4 Marks]**
- b) Outline FOUR important legal implications of a contract. **[4 Marks]**
- c) What is specification? Differentiate between general specification and detailed specification. **[3 Marks]**
- d) Discuss FIVE purposes of valuation in details. **[5 Marks]**
- e) A pumping set with a motor has been installed in a building at a cost Kshs.25000.00. Assuming the life of the pump as 15 years, workout the amount of annual installment of sinking fund to be deposited to accumulate the whole amount of 4% compound interest **[4 Marks]**