



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

**MAIN CAMPUS**

**UNIVERSITY EXAMINATIONS 2022/2023 ACADEMIC YEAR**

**4<sup>TH</sup> YEAR SECOND SEMESTER EXAMINATIONS**

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

**COURSE CODE: BTB 354**

**COURSE TITLE: CONSTRUCTION COST ESTIMATING AND  
ANALYSIS I**

**DATE: 21<sup>ST</sup> APRIL 2022**

**TIME: 8 – 10 A.M**

**INSTRUCTIONS:**

1. This paper contains FOUR questions
2. **Question ONE (1) is Compulsory**
3. **Attempt a total of THREE questions in this booklet.**
4. Marks for each question are indicated in the parenthesis.

Examination duration is **2 Hours**

**MMUST observes ZERO tolerance to examination cheating**

This Paper Consists of 3 Printed Pages. Please Turn Over.

**QUESTION ONE (COMPULSORY -40MKS)**

- a) Construction cost estimating is the process of forecasting the cost of building a physical structure. Discuss its significance in a construction project (4mks)
- b) State the process of estimating in a construction project (4mks)
- c) Clearly outline the process for formation of a building contract. (4mks)
- d) Describe the following types of estimates
  - i) Design estimates
  - ii) Bid estimates
  - iii) Control estimates (6mks)
- e) Define the term bills of quantities and state its purpose in construction industry. (4mks)
- f) Explain the following parts of the bills of quantities
  - i) Prime cost (2mks)
  - ii) Provisional sums (2mks)
  - iii) Preamble clauses (2mks)
- g) Define the term specifications. Give an account of General and detailed specifications (4mks)
- h) Define construction cost analysis and state factors that determines its process (4mks)
- i) Describe the costs in a construction projects (4mks)

**Attempt ANY 2 Questions from this section (30MKS)**

**QUESTION TWO**

- a) Define the term 'tendering' and state methods used in tendering (4mks)
- b) Describe types of quantity units in a building project giving examples for each quantity unit described. (6mks)
- c) Use the details in the table below to determine the weight of the given reinforcement bars taking the standard length of 12.0 metres. (5mks)
  - i) 20T16
  - ii) 35T8
  - iii) 25T20

**Table Q.2**

Size (mm)	6	8	10	12	14	16	18	20	25	32	40	50
Area (mm <sup>2</sup> )	28.3	50.3	78.5	113.0	153.96	201.0	254.0	314.0	491.0	804.0	1257.0	1963.0
Weight (kg per m)	0.222	0.395	0.617	0.888	1.209	1.58	2.00	2.47	3.85	6.31	9.86	15.41

**QUESTION THREE**

- a) Explain the term valuation in a building contract. Prepare a diagrammatic presentation of valuation, certification and payment to a general contractor from pre-tender to defects repair periods. Assume 9 valuations during the contract periods. (6mks)
- b) One of the projects in the Economic stimulus in Nakuru Constituency is a model school budgeted to cost 30 million when complete. The contract period is estimated as 15 months, excluding defects liability period of six (6) months and final payment 2 months after the defects liability period. If the valuations per respective months are as tabulated below and retention percentage is 10%, draw out the valuation certificate for the whole 20 months period. (9mks)

**Table Q.3 VALUATION SCHEDULE**

MONTH	AMOUNT (KSHS)
1	1,500,000
2	1,000,000
3	1,500,000
4	1,300,000
5	1,700,000
6	1,200,000
7	1,800,000
8	2,000,000
9	1,900,000
10	3,100,000
11	1,800,000
12	2,200,000
13	3,500,000
14	3,000,000
15	2,500,000
<b>TOTAL</b>	<b>30,000,000</b>

## QUESTION FOUR

Determine the material quantities and the cost of a substructure for Mr. Obungongo's house measuring 9.0m x 7.2m internally. (15mks)

### Specifications

- The foundation is concrete strip 600mm x 200mm (1:3:6)
- Foundation wall is dressed quarry stones 250 x 300mm 1.0m deep from the stripped level.
- The hardcore is a well compacted layer of rough natural stones 300mm thick.
- The blinding of 50mm murrum.
- DPM is 1000g polythene paper.
- Over site concrete is 150mm thick concrete mix (1:2:4)

### Take

1. Ballast (1600kg/m<sup>3</sup>) @ Kshs.2, 000/= per tone.
2. Sand (1450kg/m<sup>3</sup>) @ Kshs.800/= per tone
3. Hardcore (1500kg/m<sup>3</sup>) @ Kshs.600/= per tone.
4. Murrum (1350kg/m<sup>3</sup>) @ Kshs.500/= per tone.
5. Cement (37 litres/bag) @ Kshs.800/= per bag
6. Water (litres) @ Kshs.1.0 per litre.
7. Dressed stones (meters) Kshs.30 per meter
8. Excavation
  - i) Stripping (150mm thick), 1 casual/m<sup>3</sup> @ Kshs.100/= per m<sup>3</sup>
  - ii) Trench (1 casual/m<sup>3</sup>) @ Kshs.150/= per m<sup>3</sup>
9. Water to cement ratio (1:2.5)
10. 30% for wastage, spillage and shrinkage
11. Mortar (1:4) – taking 25% of the foundation wall
12. Construction takes 18 days
  - i) 6 casual @ Kshs.300/= per head per day.
  - ii) 3 masons @ Kshs.500 per head per day