(*University of Choice*)

MASINDE MULIRO UNIVERSITY OF SCIENCE AND TECHNOLOGY (MMUST)

MAIN CAMPUS

UNIVERSITY EXAMINATIONS 2019/2020 ACADEMIC YEAR

THIRD YEAR SECOND SEMESTER EXAMINATIONS

FOR THE DEGREE OF BACHELOR OF TECHNOLOGY IN BUILDING CONSTRUCTION

COURSE CODE: BTB 354

COURSE TITLE: CONSTRUCTION COST ESTIMATES AND ANALYSIS I

DATE: FRIDAY 13TH NOVEMBER 2020 TIME: 9.00 – 11.00 AM

INSTRUCTIONS:

1. QUESTION ONE IS COMPULSORY
2. Attempt any other TWO questions
3. Marks for each question are indicated in the parenthesis.

Examination duration is **2 Hour**

MMUST observes ZERO tolerance to examination cheating

This Paper Consists of 4 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

Size (mm)	6	8	10	12	14	16	18	20	25	32	40	50
Area (mm^2)	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

Table Q.2

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)

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
TOTAL	**30,000,000**

Table Q.3

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 600m 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 murram.
- DPM is 1000g polythene paper.
- Over site concrete is 150mm thick concrete mix (1:2:4)

Take

1. Ballast (1600kg/m³) @ Kshs.2, 000/= per tone.
2. Sand (1450kg/m³) @ Kshs.800/= per tone
3. Hardcore (1500kg/m³) @ Kshs.600/= per tone.
4. Murram (1350kg/m³) @ 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/m³ @ Kshs.100/= per m³
    ii) Trench (1 casual/m³) @ Kshs.150/= per m³
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