



MURANG'A UNIVERSITY OF TECHNOLOGY
SCHOOL OF ENGINEERING AND TECHNOLOGY
DEPARTMENT OF BUILDING AND CIVIL ENGINEERING

UNIVERSITY ORDINARY EXAMINATION

2024/2025 ACADEMIC YEAR

SECOND YEAR FIRST SEMESTER EXAMINATION FOR BACHELOR
OF TECHNOLOGY EDUCATION IN CIVIL ENGINEERING

EBT 400 – ESTIMATION AND COSTING

DURATION: 2 HOURS

INSTRUCTIONS TO CANDIDATES:

1. Answer question ONE and any other two questions.
2. Mobile phones are not allowed in the examination room.
3. You are not allowed to write on this examination question paper.

SECTION A – ANSWER ALL QUESTIONS IN THIS SECTION

QUESTION ONE (30 MARKS)

- a) Define the following terms as used in Estimation and costing: (6 marks)
 - i. Estimation
 - ii. Costing
 - iii. Unit rate
- b) State components of unit rate. (4 marks)
- c) Explain two type of Estimating. (6 marks)
- d) Differentiate between direct waste and indirect waste. (4 marks)
- e) Highlight four sources of cost information. (4 marks)
- f) Outline the reasons why the rates quoted for concrete works by different contractors may differ from one another. (6 marks)

SECTION B– ANSWER ANY TWO QUESTIONS IN THIS SECTION

QUESTION TWO (20 MARKS)

- a) Describe the following terms as used in estimating giving one example under each.
 - i. All-in material rate.
 - ii. All-in plant rate
 - iii. All-in labour rate(6 marks)
- b) Define the term profit and outline four reasons for contractor to earning it. (6 marks)
- c) Build up a detailed hourly rate for the general foreman using the data in APPENDIX II below. (8 marks)

QUESTION THREE (20 MARKS)

- a) Explain the elements that are considered when calculating the cost of material as components of unit rate. (6 marks)
- b) Build up unit rate for vibrated reinforced concrete (1:2:4) in 150 mm thick suspended slab (per m²). Use the data in APPENDIX III below. (14 marks)

QUESTION FOUR (20 MARKS)

- a) Describe the two types of overhead cost giving two examples under each. (8 marks)
- b) Build up unit rate for hiring a roller per m³. Use the data in APPENDIX IV. (12 marks)

APPENDIX

I. GENERAL INFORMATION

Skilled labour	sh. 120
Unskilled labour	sh. 80

Densities

Cement	1440kg/m ³
Sand	1600kg/m ³
Ballast	1700 k/m ³

II. LABOUR CONSTANTS

Working period	40 hours per week
Annual leave	36 hours per year
Sick leave	14 days per year
Basic hourly pay	50% of basic hourly rate
Medical benefit	600 per year
Trades supervision	sh.10 per hour
NHIF	10% of medical benefit per year
NSSF	5% direct earnings per annum
Overtime	2 hours on weekend

III. CONCRETE WORKS

Cement per bag	shs.800
Sand per m ³	shs.1500
Ballast per 7 tonne lorry	shs.15, 000
Purchase price of mixer	sh.120, 000
Life span of mixer	5 years
No of hours in a year	1800hours
Oil consumption per week	10 litres @ sh.500 per litre
Resale value of mixer	sh.40, 000
Haulage and mixer to and from site per year	sh.18, 000
Maintenance and repair	20% annual depreciation
Insurance and taxed per annum	10% purchase price
Working hours per day	8 hours
Output of mixer	4.8m ³ per hour

IV. PLANT

Purchase Price of 8 Tonnes Roller	sh. 6,500,000
Economic working life of roller	5 years
Working hours per year	1800 hours
Working hours per week	40 hours
Diesel consumption per day	60 litres @ sh. 170 per litre
Oil consumption per week	10 litres @ sh. 600 per litre
Salvage value of roller	sh. 600,000
Haulage cost per year	sh. 890,000
Insurance per annum	4% purchase price