



# MACHAKOS UNIVERSITY COLLEGE

(A Constituent College of Kenyatta University)  
University Examinations for 2014/2015

**SCHOOL OF ENGINEERING AND TECHNOLOGY**

**DEPARTMENT OF BUILDING AND CIVIL ENGINEERING**

**Second Year Second Semester Examination For Diploma In Civil Engineering and diploma  
In Building Construction Technology**

**CONSTRUCTION MANAGEMENT ESTIMATING AND COSTING II MODULE III**

**DATE: 19/3/2015**

**TIME: 3 HRS**

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***Instructions***

- *Answer two questions from section a and two questions from section b and any other one question from section A or B*

**SECTION A ANSWER ANY TWO QUESTIONS**

1.
  - a) Outline seven factors to consider when choosing a materials supplier.
  - b) Explain briefly, the responsibilities of the following personnel in a pre-tender planning meeting.
    - i) General manager
    - ii) Contracts managers
    - iii) Planning engineer
    - iv) Buyer
    - v) Office manger
    - vi) Job estimator
    - v) Client
2.
  - a) Explain the following documents as used in the supply of materials in a construction site:
    - i) Advice note
    - ii) Delivery note

(13 marks)

- iii) Invoice
- iv) Requisition form
- v) Order (10 marks)

b) Explain four control measures that need to minimize pilfering and theft of materials on site. (8 marks)

c) Mention two roles for each of the following:

- i) Quantity survey
- ii) Clerk of works (2 marks)

3. a) State any five benefits of work study to a construction company. (5 marks)

b) If an element took 20 minutes and was given a rating of 80%, calculate the basic time. (4 marks)

c) List down six reasons that may lead to an investigation on an exiting job in an organization. (6 marks)

d) Briefly explain the significance of a site visit report when preparing to tender for a contract. (5 marks)

4. a) State four advantages of critical path method of planning over the gant chart. (4 marks)

b) The table below shows the activities of a project.

Draw a critical path diagram and indicate the critical path diagram and indicate the criticals path. Determine the project duration and show the earliest and latest starting time each activity. (16 marks)

| Activity | Duration (in weeks) | No. of operative (per week) |
|----------|---------------------|-----------------------------|
| 1-2      | 4                   | 4                           |
| 1-3      | 3                   | 6                           |
| 1-4      | 6                   | 5                           |
| 2-7      | 7                   | 6                           |
| 2-5      | 0                   | 0                           |
| 3-5      | 5                   | 4                           |
| 4-5      | 4                   | 3                           |
| 4-6      | 2                   | 2                           |
| 5-7      | 5                   | 7                           |
| 6-7      | 3                   | 4                           |

## SECTION B: ANSWER TWO QUESTIONS

5. Using the given data in appendix 'A' build up the rate for the following item excavation of trench foundation commencing from ground level and n.e 1.5m deep (per cm). (20 marks)
6. Using the given data determine the unit rate for:-
- (i) Plain concrete mix 1:3:6 20mm aggregates in foundation hand mix.
  - (ii)
  - (iii) 16mm high tensile steel bars including tying wire and cover blocks in kg. (20 marks)
7. (a) Outline two methods used in calculation depreciation of a mechanical plant. (4 marks)
- (b) State eight elements that are considered in calculating cost of owning the plant. (4 marks)
- (c) A mixing machine costs ksh.480,000 and has a scrap value of Ksh.100,000 and has a useful lifespan of 4 years. Calculate its yearly depreciation cost and the rate of the plant at beginning of every year using the sum of number of years method. (4 marks)
- (d) A mechanical plant costs Ksh.500,000. The plant has a lifespan of 4 years. The salvage value of the plant is ksh.1,500,000 . Insurance @5% of initial cost, annually interest @15% of initial cost, taxes @ 10% of annual depreciation, maintenance @20% of annual depreciation. Calculate the annually cost of the plant, if the plant works 2300hrs annually. Use the straight line method of depreciation. (8 marks)
8. (a) State four elements that are considered in estimating and costing. (2 marks)
- (b) Define the term preliminary as used in estimating and costing. (2 marks)
- (c) Using data in appendix 'A' price preliminary items
- (i) Water for the works
  - (ii) Site foreman (16 marks)

## APPENDIX 'A'

### I

|                                                        |                     |                                      |
|--------------------------------------------------------|---------------------|--------------------------------------|
| Purchase price for compressor                          | =                   | Kshs. 1,800,000                      |
| Risk value after 3 years                               | =                   | Kshs.600,000                         |
| Interest on capital                                    | =                   | 10% per annum of initial cost        |
| Transport to and from site                             | =                   | @ 10000ksh per year                  |
| Maintenance                                            | =                   | 70% of annual depreciation = 200 hrs |
| Hours worked in 1 year                                 | =                   | 2000 hours                           |
| Fuel consumption 5 litres 1 hr of diesel @ 50ksh/litre |                     |                                      |
| Operator @ 40ksh/hr                                    |                     |                                      |
| Labour constant                                        | 6hrs/m <sup>3</sup> |                                      |

### II

Cement 50kg bag @ 600/=

Sand 1 tonne @ 1000/=

Aggts 1 tonne @1500/=

Cement density = 1440kg/m<sup>3</sup>

Sand density = 1500kg/m<sup>3</sup>

Aggts density = 1500kg/m<sup>3</sup>

Compaction and waste = 30%

Labour @ 25ksh/hr

### III

Cost of 1 kg = ksh.1500

Binding wire @ 152ksh/kg

Spacer blocks @ 5 ksh each

Steel fixer @ 50ksh/hr

Labourer @ 25ksh/hr

### IV

Assume payment for connection to NWCC Board @6500/=

Site reticulation, excavation, pipe work & fitting @ 80,000/=

Monthly payment say @5000 per month

### VI

- Salary say @25000 per month
- House allowance @ 120,000 per month
- Entertainment allowance @4,000 per month
- Car allowance @15000 per month
- Medical allowance @ 5000 per month
- Assume any other necessary information