



MACHAKOS UNIVERSITY COLLEGE

School of Engineering and Technology

Department of Building and Civil Engineering

**Module III Second Term Examination for Diploma in Civil
Engineering**

Diploma in Building Technology

**2707/304 Construction Management II, Estimating and Costing
II**

**2705/304 Construction Management II, Estimating and Costing
II**

INSTRUCTIONS

- This paper consists of Eight Questions in Two Section; A and B
- Answer any Five questions choosing THREE questions from Section A and Two questions from Section B,
- All questions carry equal marks
- Maximum marks for each part of a question are as shown.

- a) Explain the aim of work study in an organization. (2 marks)
 - b) List down four objectives of work study. (4 marks)
 - c) Define the terms methods study and work measurement. (4 marks)
 - d) the following data concerns the assembly of one electric switch;
 - Mean observed time for assembly 0.9 min
 - Performance rating 110%.
 - Personal allowance 7%.
 - a) Determine the standard time for the assembly of one switch.
 - b) The number of switches assembled in a shift of 8 hours. (10 marks)
- a) Explain three remedies for breach of contract. (6 marks)
 - b) Outline three defences which a defendant may put out forward for an action of trespass on land. (6 marks)
 - c) Outline four ways of terminating a contract or offer. (8 marks)
- a) Explain two forms of defamation and briefly explain two defenses and two remedies for defamation. (12 marks)
 - b) Explain each of the following as applied in law;
 - i) Vicarious liability
 - ii) Negligence
 - iii) Trespass

- iv) Arbitration (8 marks)
4. a) Define the following as used in property ownership;
- i) Leases
 - ii) Mortgage
 - iii) Freehold (6 marks)
- b) List down five sources of law in Kenya. (5 marks)
- c) Outline four factors that make a contract null and void. (6 marks)
- d) State three circumstances under which a contract is discharged by frustration. (3marks)
5. a) State four advantages of critical path method of planning over the Gantt chart. (4 marks)
- b) the table below shows the activities of a project:

Activity	Event	Duration (Weeks)
A	1-2	2
B	1-3	3
C	1-4	4
D	2-5	5
E	3-5	6
F	4-2	7
G	4-6	8
H	5-7	5
I	7-8	9
J	6-8	0
K	6-9	9
L	8-10	11
M	9-10	12

- i) Prepare an arrow network diagram.
 - ii) Calculate the earliest starting time and latest starting time for each activity.
 - iii) Show the critical path and project duration. (16 marks)
6. [a] Briefly explain any five roles of a construction estimator in the construction industry. (10marks)
- [b] Differentiate the meaning of the following terms as used in building up of unit rates:
- (i) Net rate
 - (ii) Gross rate
 - (iii) Overheads
 - (iv) Profit
 - (v) Labour constants (10marks)
7. Build up unit rate per m³ for providing a 175mm thick reinforced concrete floor slab given the following data:

- Length of slab = 6m
- Width of slab = 3.5
- Concrete ratio = 1:2:4
- Density of cement = 1550kg/m³
- Density of ballast = 1400kg/m³
- Density of sand = 1700kg/m³
- Cost of ballast per 7 tonne lorry = kshs 12,000.00
- Cost of sand per 7 tonne lorry = kshs 16,000.00
- Cost of cement per tonne = kshs 14,000.00
- Cost of reinforcement (Y12) per one length = kshs 550
- Cost of reinforcement (Y8) per one length = kshs 400

Make other relevant assumptions.

(20marks)

8. Build up unit rate per m³ for using an excavator to excavate an area of 1500m² to a depth of 1.5m starting from the stripped level. Use the following data:

- Hiring rate of excavator per hour = kshs 20,000.00
- Fuel consumption per hour = 15litres
- Cost of fuel per litre = kshs 80.00
- Oil and lubrication per hour = 2litres
- Cost of oil and lubrication per litre = kshs 185.00
- Plant output per hour = 4.5m³
- Plant efficiency = 85%
- Skilled labour per hour = kshs 150.00
- Unskilled labour per hour = kshs 65.00

Make other relevant assumptions.

(20marks)