



TECHNICAL UNIVERSITY OF MOMBASA  
**Faculty of Engineering &  
Technology**

DEPARTMENT OF BUILDING & CIVIL ENGINEERING  
UNIVERSITY EXAMINATION FOR BACHELOR OF SCIENCE IN CIVIL  
ENGINEERING (BSCE)

ECE 2306: ENGINEERING SURVEYING III

**END OF SEMESTER EXAMINATION**

**SERIES: AUGUST 2013**

**TIME ALLOWED: 2 HOURS**

**Instructions to Candidates:**

You should have the following for this examination

- *Answer Booklet*

This paper consists of **FIVE** questions.

Answer question **ONE (COMPULSORY)** in section **A** and any other **TWO** questions from section **B**

Maximum marks for each part of a question are as shown

This paper consists of **THREE** printed pages

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**SECTION A**

**Question One (Compulsory)**

- a) Determine the area in hectares enclosed by the line of a closed traverse survey from the following data:

Station	E(m)	N(m)
A	200.00	300.00
B	306.98	385.65

C	368.55	282.02
D	395.93	278.80
E	200.74	185.70

If the chain used, nominally 20m long, used on the survey was later found to be 0.2m too long, what will be the corrected value for the area? (10 marks)

- b) A cutting is to be Outline the main features of a plant policy for a construction company. (6 marks)
- c) Highlight the key aspects considered when selecting plant. (5 marks)
- d) With the aid of a typical example, outline any THREE methods of depreciating plant. (9 marks)
- e) Discuss the main factors involved in maintaining inventory the costs involved and the possible disadvantages of maintaining low inventory and high inventory levels.

**SECTION B (Attempt any TWO questions)**

**Question Two**

Rearrange the following activities according to relationship, determine the critical path and tabulate the total float for the network. (20 marks)

ACTIVITY	DURATION	PRECEDING ACTIVITY
T	7	Q
M	4	H
J	9	F
B	3	A
Q	8	L, P
H	8	E, D
L	6	H, G, K
M	6	H
P	3	O
F	15	A
S	12	O
E	8	B
C	4	A
K	3	J
O	3	H
U	4	R, S, T
A	9	-
D	15	B
G	2	C
R	6	M, N

**Question Three**

Brollo-Co, is drawing production plans for the coming year. Three products are available with the following characteristics.

Product		P	Q	R	S
Amount per unit					
Selling price		300	425	575	
Cost of materials		75	80	60	
Labour – grade	A	200	150	-	
	B	150	200	200	
	C	100	300	150	
Variable overheads		150	300	300	

Fixed Costs 2,350,000 per annum.

Each grade of labour is paid – 300 per hour but skills are specific to grade. The annual supply of each grade is limited as follows (maximum

Grade A	7,000hrs
B	12,000hrs
C	14,000hrs

- a) Calculate the product mix which will maximize profit for the year and state the amount of profit.  
 b) Calculate the minimum price at which the sale of product Q would be worthwhile. **(10 marks)**

#### Question Four

- a) List two methods of depreciating plant **(6 marks)**  
 b) A mechanical shovel of capacity 1.2m<sup>3</sup>, was purchased at ksh 12,500,00. It has working life of 6 years, and a resale value of ksh 3,500,000. Determine its production capacity per hour. Assume all other necessary data not provided. **(14 marks)**

#### Question Five

There are three mutually exclusive options, P, Q, R. A conditional profit table has been prepared as follow:

Profit in 000

		Outcome		
		1	H	H
Option	P	120	125	240
	Q	(75)	180	240
	R	90	60	250

Probabilities of each outcome occurring - 0.3 0.8 0.4

Which option should be selected using:

- (i) The maximum criterion
- (ii) The minimax regret criterion
- (iii) The expected values criterion?

**(20 marks)**