



THE TECHNICAL UNIVERSITY OF MOMBASA

# Faculty of Engineering & Technology

DEPARTMENT OF COMPUTER SCIENCE & INFORMATION TECHNOLOGY

DIPLOMA IN INFORMATION COMMUNICATION TECHNOLOGY  
(DICT10M)

**EIT 2306: QUANTITATIVE TECHNIQUES I**

SPECIAL/SUPPLEMENTARY EXAMINATION

**SERIES: FEBRUARY 2013**

**TIME: 2 HOURS**

**Instructions to Candidates:**

You should have the following for this examination

- *Answer Booklet*

This paper consist of **FIVE** questions  
 Answer question **ONE (COMPULSORY)** and any other **TWO** questions  
 Maximum marks for each part of a question are as shown  
 This paper consists of **THREE** printed pages

**Question One (Compulsory)**

- a) State **FIVE** characteristics of Linear programming model. **(5 marks)**
- b) A Rancher makes two types of animal feeds 1 & 2 by mixing three inputs P, Q and R. The weekly costs and availability of the inputs are given below

Inputs	Amount (kgs)
P	2500
Q	5000
R	7500

The requirement of each type of input is percentage is given below:

Animal feed		Percentage Requirement		
		P	Q	R
Type	1	25	55	20
	2	40	20	40

Given that the cost of mixing each unit of animal feed type 1&2 is ksh 200 and ksh 240 respectively:

- (i) Formulate problem as linear programming model. **(10 marks)**
- (ii) Calculate the level of production that the Rancher will produce his feeds to minimize cost and the actual total cost. **(15 marks)**

**Question Two**

- a) Discuss the difference between scatter graph and high-low method of forecasting future costs and revenue. **(5 marks)**
- b) The following data was extracted from Jambo Biscuits Ltd books of accounts on costs and output.

Output (000s)	Costs (000s)
1	14
2	17
3	15
4	23
5	18
6	22
7	31

Using the above data, calculate the coefficient in the linear cost function  $y = a + bx$  and estimate the value of y when x is 10. **(15 marks)**

**Question Three**

- a) State **FOUR** importance of time series analysis. **(4 marks)**

b) Write short notes on the following components of time series:

- (i) Seasonal variation
- (ii) Cyclical variations
- (iii) Secular trend
- (iv) Irregular variations

**(16 marks)**

#### Question Four

a) State **FIVE** importance of index number.

**(5 marks)**

b) In the following data below compute price index under by using 1991 as the base year.

Year	1991	1992	1993	1994	1995	1996	1997	1998
Rice of sugar per kg	8	10	12.50	18	22	25	30	38

**(15 marks)**

#### Question Five

a) Stay Free Kenya Ltd has four salesmen each of them can be assigned to any of the four sales territories. The estimates of the sales revenue for each salesman is as follows below in thousands kshs.

		Sales Territories			
		1	2	3	4
Salesman	A	65	78	83	60
	B	85	52	59	44
	C	83	56	69	64
	D	49	80	85	84

Required:

Find out the optimal assigned pattern that will maximize the sales revenue and the actual total revenue.

**(20 marks)**