



THE MOMBASA POLYTECHNIC UNIVERSITY COLLEGE

(A Constituent College of JKUAT)

(A Centre of Excellence)

Faculty of Engineering & Technology

DEPARTMENT OF COMPUTER SCIENCE & INFORMATION TECHNOLOGY

**DIPLOMA IN INFORMATION COMMUNICATION TECHNOLOGY
(DICT10M)**

EIT 2306: QUANTITATIVE TECHNIQUES I

END OF SEMESTER EXAMINATION

SERIES: DECEMBER 2012

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 **FOUR** advantages of using moving averages. **(4 marks)**
- b) The data given below refers to a hypothetical data assumed to have a uniform cyclical duration of fire years and equal amplitude of the units.

Year	Original Value	Year	Original Value
1	3	11	5
2	4	12	6
3	5	13	7
4	4	14	6
5	3	15	5
6	4	16	6
7	5	17	7
8	6	18	8
9	5	19	7
10	4	20	6

Required:

- (i) Compute the moving total for the five year period. **(6 marks)**
 (ii) Compute the moving averages for the five year period. **(8 marks)**
 (iii) Plot the data on a graph and show the trend. **(12 marks)**

Question Two

- a) Likoni Furniture Limited plans to make two products, ordinary and executive chairs from available resources of 106 metres of timber and 92 man hours of labour. An executive chair requires 3 metres of timber and 2 man hours of labour and yields a profit of kshs 250 while an ordinary chair requires 2 metres of timber and 4 man hours of labour and yields a profit of kshs 150.

Required:

- (i) Formulate problem as a linear programming model. **(6 marks)**
 (ii) Calculate the production level that maximizes profits and the actual total profit at that production level. **(14 marks)**

Question Three

- a) State **FOUR** characteristics of assignment problem. **(4 marks)**
- b) A transport company has three buses operations in four cities A, B, C and D. The distance differs from one city to the other as follows:

		Cities (Kms)			
		A	B	C	D
Buses	1	33	40	43	32

2	45	28	31	23
3	42	29	36	29

Required:

Assign a bus to a city in such a way that the total distance travelled is minimized. **(16 marks)**

Question Four

- a) Explain with a good graph what is a scatter diagram and how it can be used in studying correlation between two variables **(5 marks)**
- b) An Agricultural Officer wanted to find out the relationship between maize production and the use of fertilizers. The data below shows the figures he obtained from the field.

Fertilizer Used (Tones)	15	18	20	24	30	35	40	45
Maize Production (Tones)	85	93	95	105	120	130	150	160

Using the above data, calculate: **(12 marks)**

- (i) The coefficient in the linear cost function $y = a + bx$.
- (ii) The production of maize (y) when fertilizer used (x) is 60 tones. **(3 marks)**

Question Five

- a) From the following data, calculate the index numbers for 1996 taking 1989 as the base year using:
- (i) Laspeyres
- (ii) Peasches
- (iii) Fishers

	1989		1996	
	Price	Quantity	Price	Quantity
	(Kshs)	(Kgs)	(Kshs)	(Kgs)
Maize	65	20	135	30
Wheat	95	80	160	7
Beans	150	5	320	8

(20 marks)