TECHNICAL UNIVERISTY OF MOMBASA

Faculty of Engineering & Technology

DEPARTMENT OF COMPUTER SCIENCE & INFORMATION TECHNOLOGY

DIPLOMA IN INFORMATION TECHNOLOGY (DIT 2K 11)

ECT 2211: QUANTITATIVE TECHNIQUE

SPECIAL/SUPPLEMENTARY EXAMINATION
SERIES: OCTOBER 2013
TIME: 2 HOURS

<u>**Instructions to Candidates:**</u>
You should have the following for this examination
- *Answer Booklet*

This paper consists of **FIVE** questions. Attempt question **ONE** 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) Construct the chain base index number from the following data.　　　　　**(10 marks)**

Year	1991	1992	1993	1994	1995	1996
Price (shs)	120	125	140	150	135	160

b) Construct a consumer price index number from the table given below:

Group	Index for 1996	Expenditure
Food	550	46%
Clothing	215	10%
Fuel & Lighting	220	7%
House Rent	150	12%
Miscellaneous	275	25%

c) Explain FOUR uses of index numbers　　　　　**(5 marks)**

Question Two

a) Find the coefficient of correlation between the use of fertilizers and productivity from the following figures **(12 marks)**

Fertilizers used (tonnes)	15	18	20	24	30	35	40	45
Productivity of land (tonnes)	85	93	95	105	120	130	150	160

b) Determine the co-efficient of correlation in 'a' above and comment on your answer **(8 marks)**

Question Three

Two Managers are asked to rank a group of employees in order of potential for eventually becoming top manager. The rankings are as follows:

Employee	Ranking by Manager 1	Ranking by Manager 1
A	10	9
B	2	4
C	1	2
D	4	3
E	3	1
F	6	5
G	5	6
H	8	8
I	7	7
J	9	10

a) Compute the coefficient of rank correlation and comment on the value **(10 marks)**

b) What are the merits and demerits of ranking **(10 marks)**

Question Four

A manufacturing company manufactures 3 products X, Y and Z which earn a contribution per unit of £6, £4 and £3.5 respectively. The resources required to make. One unit of each product is given below:

	X	Y	Z
Direct Labour Hrs	2	3	4
Machine Hrs	4	3	1

Next month there will only be 700 direct

Labour hours and 8000 machine hrs available to production. The demand for each product is unlimited.

Required:

Determine how much of X, Y and Z the company should product if it wishes t maximize its construction next month **(20 marks)**

Question Five

Using the following Linear Programming model to apply the graphical method:

$$Max\ Z = 8x + 10y$$

$$y \geq z$$
$$x \geq 2$$
$$4x + 2y = 24$$
$$x, y \geq 0$$

(NB use the constraints to construct the graph) **(20   marks)**