



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

**DEPARTMENT OF COMPUTER SCIENCE & INFORMATION  
TECHNOLOGY**

DIPLOMA IN INFORMATION TECHNOLOGY

**ECS 2210: QUANTITATIVE TECHNIQUES**

SPECIAL/SUPPLEMENTARY EXAMINATION

**SERIES: OCTOBER 2013**

**TIME: 2 HOURS**

**Instructions to Candidates:**

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 small holder is interested in increasing the growth rate of his maize during the critical spring growing period so that he may harvest a head of his competitors. He experimented by growing several plot of the crop over some years and finds the following:

| Water fed to plot during critical period (000 litres) | Growth during the period (cm) |
|---|-------------------------------|
| 2   | 4                             |
| 2   | 5                             |
| 1   | 3                             |
| 4   | 9                             |
| 5   | 8                             |
| 3   | 7                             |
| 7   | 13                            |

Required:

- a) Use Karl Pearsons product moment co-efficient of correlation to measure the association between the amount of water fed and growth during the period. Interpret your results. **(15 marks)**
- b) Compute co-efficient of determination **(5 marks)**
- c) Find out growth during the period if 10,000 litres of water are fed to the plant. **(10 marks)**

**Question Two**

- a) The following data relates to the prices and quantities of four commodities in ABC company Ltd for the year 1992 and 1993.

| Commodity | 1992  |     | 1993  |     |
|-----------|-------|-----|-------|-----|
|           | Price | Qty | Price | Qty |
| A         | 5     | 100 | 6     | 150 |
| B         | 4     | 80  | 5     | 100 |
| C         | 3     | 60  | 5     | 72  |
| D         | 12    | 30  | 9     | 33  |

Required:

- a) Compute the following indices
  - (i) Las Pyres Index Number
  - (ii) Paasche Index Number
  - (iii) Fisher Ideal Index Number
  - (iv) Marshall Edgeworth Index Number **(15 marks)**
- b) Why is Fisher Ideal Index Number called so, discuss **(5 marks)**

### Question Three

a) Calculate trend by FOUR yearly moving average of the data given below:

|            |      |      |      |      |      |      |
|------------|------|------|------|------|------|------|
| Year       | 1980 | 1981 | 1982 | 1983 | 1984 | 1985 |
| Production | 614  | 615  | 652  | 678  | 681  | 655  |

b) Comment on the above moving average (5 marks)

### Question Four

a) Define Linear programming model (2 marks)

b) State applications of linear programming model (5 marks)

c) Given the maximum function  $Z = 3x + 10$

$$3x + 2y \leq 5$$

$$2x + y \leq 10$$

$$x, y \geq 0$$

Subject to

Required:

- a) Show the feasible region graphically (10 marks)  
b) Compute the optimal solution (3 marks)

### Question Five

Write short notes on:

- a) Linear programming  
b) Composite Index number  
c) Chain index number  
d) Fixed-based relative index  
e) Production index number (20 marks)