



TECHNICAL UNIVERSITY OF MOMBASA
Faculty of Engineering & Technology

DEPARTMENT OF COMPUTER SCIENCE & INFORMATION TECHNOLOGY

DIPLOMA IN INFORMATION TECHNOLOGY
(DIT 10M)

ECS 2310: QUANTITATIVE TECHNIQUES III

SUPPLEMENTARY/SPECIAL EXAMINATIONS

SERIES: FEBRUARY 2013

TIME: 2 HOURS

INSTRUCTIONS:

- This paper consists of **FIVE** questions.
- Answer question **ONE (Compulsory)** and any other **TWO** questions.
- Use Scientific Calculator.

This paper consists of Four printed pages.

SECTION A (Compulsory)

QUESTION 1

- a) Distinguish between the following terms as used in index numbers:
i) Base year
ii) Current year (4 marks)
- b) State and explain **TWO** methods that are used to determine the trend in time series analysis. (4 marks)
- c) Explain the following components of time series:
i) Cyclic movement
ii) Random factor
iii) Secular trend. (6 marks)
- d) Describe the term seasonally adjusted data. (2 marks)
- e) The data in the table below relate to the cost and number of computers sold in the year 1995 and 1998 by a certain dealer.

Types of Computers	1995		1998	
	Price	Quantity	Price	Quantity
A	30,000	4	40,000	3
B	40,000	8	50,000	5
C	60,000	3	65,000	5
D	20,000	10	35,000	6

Calculate the expenditure index, with 1995 as the base year and interpret the result. (4 marks)

SECTION B

QUESTION 2

- a) Define the term series. (2 marks)
- b) Describe the following models of time series.
i) Additive mode
ii) Multiplicative model. (4 marks)
- c) The table below shows the revenue collection by a municipal council in Kenya for the last three successive years.

Year	Revenue C (in Ksh. Millions)			
	Quarter 1	Quarter 2	Quarter 3	Quarter 4
2009	40	50	30	26
2010	49	60	40	35
2011	60	72	51	46

- i) Determine the trend values. (6 marks)
- ii) Determine the seasonal factors. (4 marks)
- iii) Determine the random factors. (4 marks)

QUESTION 3

- a) Outline any **FOUR** advantages of index numbers. (4 marks)
- b) Distinguish between the following types of index numbers:
- i) Fishers price index
 - ii) Paasche's price index (4 marks)

c) The table below shows the quantities and prices of commodities sold by a shopkeeper.

Items	1992		1993	
	Price	Quantity	Price	Quantity
Sugar	30	50	50	56
Soap	40	100	40	120
Bread	10	60	20	60
Milk	10	30	15	24
Butter	20	40	30	36

Construct laspeyre's and paasches quantity index numbers and interpret the results. (12 marks)

QUESTION 4

- a) Distinguish between the following methods as used in time series analysis.
- i) Least squares method
 - ii) Graphical method. (4 marks)

b) Define the term cyclic movement. (2 marks)

c) The table below shows the number of vehicle parts sold by a hardware shop every quarter for a period of three years.

Year	Quarter	Sales
1996	1	130
	2	110
	3	90
	4	120
1997	1	150
	2	120
	3	100
	4	140
1998	1	170
	2	120

- i) Determine the equation of the regression on line, using the least squares method. (8 marks)

- ii) Draw a graph to represent the time series and the trend values on same axis. **(6 marks)**

QUESTION 5

- a) Explain the following financial mathematics terms:
i) Annuity
ii) Discounting rate
iii) Compound interest **(6 marks)**
- b) Determine the present value of annuity of sh. 18,000 per annum for 5 years when the discount rate is 8%. **(4 marks)**
- c) Many intends to purchase a piece of land in ten years time valued at sh. 300,000. Using a discounting rate of 20% determine the amount of money she has to invest in order to achieve her objective. **(4 marks)**
- d) A new employee intends to raise Ksh. 800,000 in three years. To achieve this objective, he decides to invest a certain amount of money on a monthly basis at an interest rate of 10% per annum compounded semi annually. Determine the amount of money he needs to invest monthly in order to achieve his objective. **(6 marks)**