



TECHNICAL UNIVERISTY OF MOMBASA

Faculty of Engineering & Technology

DEPARTMENT OF COMPUTER SCIENCE & INFORMATION TECHNOLOGY

DIPLOMA IN INFORMATION COMMUNICATION TECHNOLOGY
DIPLOMA IN INFORMATION TECHNOLOGY
(DIT 10M/DICT 10M)

ECS 2310: QUANTITATIVE TECHNIQUE III

SPECIAL/SUPPLEMENTARY EXAMINATION

SERIES: JULY 2014

TIME ALLOWED: 2 HOURS

Instructions to Candidates:

You should have the following for this examination

- *Answer Booklet*
- *Calculator and SMP Tables can be used*

This paper consist of **FIVE** questions
 Answer 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

SECTION A (COMPULSORY)

QUESTION ONE (30 MARKS)

- a) Explain the following components of time series
 (i) Cyclic movement
 (ii) Secular trend (4 marks)
- b) Describe the following type of index numbers:
 (i) Laspeyres price index
 (ii) Paasches price index (4 marks)
- c) The table below shows the quantities with their corresponding prices in 2009 and 2010

Commodity	Standard Quantity	Prices in Ksh	
		2009	2010
	W	Po	Pn
A	5	215	210
B	12	250	275
C	2	110	130
D	8	950	950

Calculate the following:

- (i) Expenditure index
 (ii) Simple aggregate price index (6 marks)
- d) Explain any **TWO** methods of determining the trend under time series analysis (4 marks)
- e) Describe any **TWO** types of correlation (2 marks)

SECTION B (Answer any two questions)

QUESTION TWO

Explain the **TWO** models of time series (4 marks)

The table below shows the details of student's enrolment in a college for three successive years.
 Use it to answer the questions that follow

Year	Student Enrolment		
	Term 1	Term 2	Term 3
2008	1500	1300	1050
2009	1600	1450	1150
2010	1750	1650	1300

- (i) Using the moving average method, determine the trend values (6 marks)

- (ii) Using the multiplicative model, determine the seasonal variation for each term (6 marks)
- (iii) Represent the above data including the trend values graphically. (4 marks)

QUESTION THREE

- a) (i) Differentiate between irregular and cyclic component of a time series.
- (ii) Describe the following terms as applied in time series
- (i) Deseasonalization
- (ii) Decomposing a time series (6 marks)
- b) The table below shows the quarterly production of keyboards at particular electronics company.

Year	1				2				3		
Quarter	1	2	3	4	1	2	3	4	1	2	3
Output in ('000)	24	50	56	63	79	89	79	80	93	100	88

- i) Calculate the Four-quarter moving average for the production (6 marks)
- ii) Plot the trend and time series curves for the production on the same axis (4 marks)
- iii) Evaluate the adjusted seasonal component for each quarter. Use additive time series model (4 marks)

Question Four (20 marks)

- a) Define the following terms as used in correlation theory.
- i) Correlation
- ii) Un-correlated
- iii) Perfect Correlation (6 marks)
- b) The table below shows the height and weight of a random sample of 10 patients. Use it to answer the questions that follow:

Patient	A	B	C	D	E	F	G	H	J	K
Height in Inch	62	64	66	68	70	72	74	76	78	80
Weight in Kg	66	67	72	72	57	76	72	76	87	82

- i) Calculate Pearson's correlation coefficient for the data. (8 marks)
- ii) Calculate the coefficient of determination for the data. (2 marks)
- iii) Interpret both the values for the coefficient of correlation and determination. (4 marks)

Question Five (20 marks)

- a) Explain the importance of regression analysis. (2 marks)
- b) State any TWO assumptions of regression analysis. (2 marks)
- c) Describe the term bivariate as used in regression. (2 marks)
- d) The table below shows the relationship between age (in years) and price (in thousands of shillings) of a BMW motor bike sold by a company dealing with secondhand motor bikes.

Age	8	3	6	9	2	5	6	4
Price	16	74	38	19	102	36	33	69

- i) Draw a scatter diagram to represent the data. (4 marks)
- ii) Determine the regression line for the data. (8 marks)
- iii) Comment on the gradient for the data. (2 marks)