THE MOMBASA POLYTECHNIC UNIVERSITY COLLEGE

(A Constituent College of JKUAT)

Faculty of Engineering & Technology

DEPARTMENT COMPUTER SCIENCE & INFORMATION TECHNOLOGY

DIPLOMA IN INFORMATION TECHNOLOGY
(DIT 2K 9J & DIT 09 M)

ECS 2310: QUANTITATIVE TECHNIQUE III

END OF SEMESTER EXAMINATIONS

SERIES: DECEMBER 2011

TIME: 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 **FOUT** questions in **TWO** sections **A** & **B**
Answer question **ONE (COMPULSORY)** and any other **TWO** questions
Maximum marks for each part of a question are as shown
This paper consists of **FOUR** printed pages

SECTION A (COMPULSORY)

Question 1(20 Marks)

a) Describe the circumstances under which each of the following time series model is applicable:

i. additive model
ii. Multiplicative model (4 marks)

b) Explain the following terms as applied in indices:

i. Unweighted index
ii. Base year (4 marks)

c) The table below shows the ranks of two students in different subjects.

Paper	Maths	ISM	C.A	Programming	SAD	ICOS
Jane	1	3	4	9	5	4
peter	3	2	5	7	8	10

Calculate the Spearman's rank correlation coefficient for the students. (5 marks)

d) Explain why it is important to carry out correlation analysis before dealing with regression analysis. (2 marks)

e) Outline the steps followed to determine the trend when using the semi average method.(3 marks)

f) State any **TWO** advantages of Laspeyres price index. (2 marks)

SECTION B (ANSWER ANY TWO QUESTIONS)

Question two 20 marks

a) Define the following terms as used in the concept of correlation theory:

i. Correlation coefficient
ii. Coefficient of determination (4 marks)

b) With aid of diagrams explain any **TWO** types of correlation. (4 marks)

c) The table below shows the marks scored by students in a Mathematics and Quantitative methods at O-level and diploma respectively. Use it to answer the questions that follow.

Student	A	B	C	D	E	F	G	H	J	K
Mathematics	55	35	30	80	45	25	60	45	20	85
QM	35	50	20	65	40	45	50	60	25	70

i. Calculate the Pearson's product moment coefficient of correlation for the data. (8 mark)
ii. Calculate the coefficient of determination for the data. (2 marks)

iii. Draw a conclusion using the coefficient of determination obtained in (ii) above. (2 marks)

Question three 20 marks

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 term index numbers. (2 marks)

b) Describe the following types of index numbers:

i. Expenditure index
ii. Simple aggregate index (2 marks)

c) The table below shows the trend of oil products for the years 2007 and 2008.

PRODUCTS	**2007**		**2008**	
	Quantity (Barrels)	Unit price ($)	Quantity (Barrels)	Unit Price ($)
Petrol	210	90	160	140
Diesel	250	80	230	120
Kerosene	340	60	290	100
Lubricant	430	30	620	80

Find the fishers ideal price index for the products. (use 2007 = 100) (10 marks)

d) 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. A weighted average of price relative
ii. A weighted aggregate price index (6 marks)