



**THE MOMBASA POLYTECHNIC UNIVERSITY COLLEGE**

**(A Constituent College of JKUAT)**

(A Centre of Excellence)

# **Faculty of Engineering & Technology**

**DEPARTMENT OF COMPUTER SCIENCE & INFORMATION TECHNOLOGY**

**DIPLOMA IN INFORMATION TECHNOLOGY  
(DIT 2K J10)**

**ECS 2310: QUANTITATIVE TECHNIQUE III**

**END OF SEMESTER EXAMINATION**

**SERIES: AUGUST 2012**

**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 **FIVE** 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 One (30 marks)**

- a) Distinguish between Laspeyers index and paascues index. (4 marks)
- b) Explain the following components of time series:  
i) Seasonal factor  
ii) Cyclic movement (4 marks)
- c) The marks obtained in Economics and accounts were tabulated as shown:

Student	A	B	C	D	E	F	G	H
<b>Economic s</b>	80	63	62	79	63	69	80	79
<b>Accounts</b>	75	65	65	82	77	65	85	81

Calculate the Spear Man's rank correlation. (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 and explain practical application of index numbers. (2 marks)

**SECTION B (Answer Any Two Questions)**

**Question Two (20 marks)**

- a) Describe **FOUR** methods of determining the trend in time series. (4 marks)
- b) Explain the term decomposing a time series. (2 marks)
- c) 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:

YEA R	STUDENT ENROLMENT		
	TERM I	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 variations for each term. (6 marks)
- iii) Forecast the student enrollment for the year 2011 in the college. (2 marks)

**Question Three (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. (4 marks)
- b) 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 Computer	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

- i) Calculate Paasche's quantity index number, with 1995 as the base year and interpret the result. (4 marks)
- ii) Calculate Fisher's Price index number with 1995 as the base year and interpret the result. (10 marks)

**Question Four (20 marks)**

- a) Define the following terms as used in the concept of regression analysis:
- i) Gradient
  - ii) Independent Variable. (4 marks)
- b) With aid of diagrams explain negative and positive gradient. (4 marks)
- c) The table below shows the marks scored by students in mathematics and quantitative methods at 0-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
Q.M	35	50	20	65	40	45	50	60	25	75

- i) Represent the above information on a scatter diagram.
- ii) Calculate the regression equation and represent it on the scatter diagram above. (12 marks)

**Question Five (20 marks)**

a) Distinguish between the following terms:

- i) Correlation co-efficient
- ii) Coefficient of determination

**(4 marks)**

b) Sketch scatter graphs to show:

- i) Perfect positive relationship
- ii) Perfect negative relationship
- iii) No particular relationship

For all cases give the value for the correlation coefficient

**(5 marks)**

c) A business consultant conducted an inquiry and recorded the following:

YEAR	Y	X
1	100	250
2	115	255
3	120	258
4	130	267
5	145	270
6	152	272
7	155	273

i) Calculate the product moment coefficient of correlation between X and Y.

ii) Calculate the coefficient of determination and interpret the result.

**(11 marks)**