THE TECHNICAL UNIVERSITY OF MOMBASA

Faculty of Engineering & Technology

DEPARTMENT OF COMPUTER SCIENCE & INFORMATION TECHNOLOGY

DIPLOMA IN COMMUNICATION & INFORMATION TECHNOLOGY
(DCIT 2K11/DICT10A/DICT 11M)

ECS 2211: QUANTITATIVE TECHNIQUES

SPECIAL/SUPPLEMENTARY EXAMINATION
SERIES: FEBRUARY 2013
TIME: 2 HOURS

Instructions to Candidates:
You should have the following for this examination
- *Answer Booklet*

This paper consist of **FIVE** questions
Answer question **ONE (COMPULSORY)** 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) Distinguish between the following terms:
(i) Regression
(ii) Correlation **(4 marks)**

b) Define each of the following terms as used in time series analysis:-
(i) Trend
(ii) Cyclic movement
(iii) Random variation **(6 marks)**

c) It is generally known that 60% of match boxes from a manufacturing process in a certain factory have exactly 40 match sticks. Based on this, determine the probability that among 12 randomly selected match boxes from the factory.
(i) Exactly 4 boxes will have 40 match sticks.
(ii) At least 4 boxes will have 40 match sticks. **(6 marks)**

d) Distinguish between Laspeyres and Paasche's index numbers. **(4 marks)**

Question Two

a) Define the following terms as used in the concept of regression analysis:-
(i) Positive gradient
(ii) Negative gradient **(4 marks)**

b) Explain the importance of regression analysis. **(2 marks)**

c) Describe the disadvantages of the graphical method in establish the regression line. **(2 marks)**

d) The table below shows data collected in a research on the relationship between monthly income and monthly expenditure of 50m. Kenyans in particular town. Use it to answer the questions that follow:

Earner	A	B	C	D	E	F	G	H	I	J
Income	44	65	50	57	96	94	110	34	79	65
Expenditure	41	60	40	50	80	68	84	30	55	48

(i) Determine the equation of the least squares regression line of expenditure on income. **(10 marks)**

(ii) Using the regression line obtained in (i) above, estimate the expected amount of expenditure of a Kenyan whose monthly income is Ksh. 75,000 **(2 marks)**

Question Three

a) Distinguish between the following terms:
(i) Correlation co-efficient
(ii) Coefficient of determination **(4 marks)**

b) With the aid of a diagram, describe TWO types of correlation. **(4 marks)**

c) The marks obtained in Quantitative technique and programming were tabulated as show below:

Student	A	B	C	D	E	F	G	H
Programming	80	63	62	79	75	69	80	76
Quantitative Tech	75	65	65	82	77	65	85	81

(i) Calculate Pearson's correlation coefficient.
(ii) Calculate the coefficient of determination and interpret the result. **(12 marks)**

Question Four

a) Define the term time series. **(2 marks)**

b) Describe the following models of time series:
(i) Additive modes
(ii) Multiplicative model **(4 marks)**

c) 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 Fishers price index number with 1995 as the base year. **(10 marks)**

Question Five

a) Outline any FOUR advantages of index numbers. **(4 marks)**

b) Distinguish between the following types of index number.
(i) Price index
(ii) Volume index **(4 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:

YEAR	**STUDENT'S 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. **(6 marks)**
(ii) Using the multiplicative model, determine the seasonal variations. **(6 marks)**