

UGANDA MARTYRS UNIVERSITY
FACULTY OF SCIENCE
FINAL ASSESSMENT SEMESTER II 2006 - 2007
BSc I GEN, B.ECON & IT TIMESERIES AND INDEX NUMBERS

DATE Tuesday 8th May 2007

TIME: 9.00 – 11.30 A.M.

Instructions:

Attempt **ANY THREE** Questions

Question One

- a) i) With relevant examples, explain the terms “Seasonal and Irregular” variations as used in time series.
ii) Distinguish between the Multiplicative model and Additive model assumptions.
- b) Given below is data on input costs for a production industry for the period 1988 to 2004

Table 1

<i>Year</i>	<i>Costs (Mill. UGX)</i>	<i>Year</i>	<i>Costs (Mill. UGX)</i>
1988	98.1	1997	196.4
1989	102.2	1998	192.8
1990	88.4	1999	192.9
1991	108.3	2000	129.9
1992	87.7	2001	220.0
1993	98.7	2002	191.9
1994	122.3	2003	237.4
1995	123.9	2004	235.6
1996	240.3		

- i) Fit a simple trend to the data given in the table 1.
ii) Calculate the trend values for the period 1990 to 2000.
iii) Forecast expenditures on inputs for the years 1980 and 2010.

Question Two

- a) Briefly discuss the preliminary adjustments of time series analysis
b) Derive the Normal Equation for the estimation of logistic curve.
c) i) Fit an exponential trend, $Y = \beta_0 e^{\beta_1 X}$ to the data in table 1.
d) ii) Compare the relative slopes of the two models in Qn 1b(i) and Qn 2C (i) in terms of steepness and coefficient parameter signs.

Question Three

- a) Distinguish between cross sectional data and time series data types.

- b) The following are monthly production costs of a sugar factory in thousand of Uganda shillings.

Year Months	2001	2002	2003	2004	2005
Jan	1354	1470	1654	1654	2206
Feb	1293	1490	1727	1727	2196
Mar	1558	1428	1365	2187	2781
April	1512	1747	2177	2058	2565
May	1523	1696	2108	2032	2749
June	1486	1693	2182	2115	2568
July	1572	1683	2023	2524	2575
Aug	1478	1678	2038	2604	2751
Sept	1394	1609	1965	2714	2775
Oct	1564	1724	2107	2724	2782
Nov	1633	1824	2253	2758	2786
Dec	1437	1903	2483	2837	2783

Construct a Seasonal Index using a Simple Average Method.

Question Four

- a) Discuss the major problems associated with the construction of the index numbers in developing countries (LDCs).
- b) Given below is data on prices and quantities of four kinds of products in country 'X' during the years 2001, 2002 and 2003.

Year	Unit Price			Quantity ('000 tons)		
	2001	2002	2003	2001	2002	2003
Maize	11.94	12.55	12.35	17.1	14.9	17.5
Beans	12.57	13.72	13.72	12.1	11.8	12
Millet	11.56	12.61	11.49	10.4	10.2	10.4
Cassava	10.53	11.57	10.55	9.7	9.8	9.2

- Construct a Simple Average Index comparing the year 2003 prices with prices of 2001=100).
- Taking 2002 as the base year, and using base year quantities as weights. Construct the Laspeyres Index which measures the change in the prices of these products from 2002 to 2003.
- Using 2002 as the base period and 2001 quantities as weights. Construct the Fixed Weight Aggregative Index that measures the change in prices from 2002 to 2003
- Comment on the results obtained in b (ii) and b (iii) above.