UGANDA MARTYRS UNIVERSITY

NKOZI

UNIVERSITY EXAMINATIONS

END OF SEMESTER FINAL EXAMINATIONS
SEMESTER II, 2015/16

FACULTY OF SCIENCE

DEPARTMENT OF MATHEMATICS AND STATISTICS

FIRST YEAR EXAMINATION FOR BECHELOR OF SCIENCE GENERAL, BUSINESS ECONOMICS & FINANCIAL MATHEMATICS

Time Series & Index Numbers
STA 1201

DATE: TUESDAY MAY 10th May, 2016

TIME: 9:30 AM – 12:30 PM

DURATION: 3 HOURS

Instructions:

1. *Carefully read through ALL the questions before attempting*
2. ***ANSWER Five (5)Questions only, all questions carry equal marks***
3. *No **names** should be written anywhere on the examination book.*
4. *Ensure that your **Reg Number** is indicated on all pages of the examination answer booklet.*
5. *Ensure your work is **clear** and **readable**. Untidy work shall be penalized*
6. *Any type of examination Malpractice will lead to automatic disqualification*
7. *Do not write anything on the questions paper.*

QUESTION ONE

a) Define the following terms
   i. Producer price index (2 marks)
   ii. Seasonal variation (2 marks)
   iii. The secular trend (2 marks)
   iv. Time series (2 marks)
   v. Irregular variation(2 marks)

b) State the components of a time series (5 marks)

c) The numbers of bank failures for the years 1994 through 1998 are given below.

Year	1994	1995	1996	1997	1998
No.of failures	79	120	138	184	200

Determine the least squares equation and estimate the number of failures in 2002.(5 marks)

QUESTION TWO

a) Identify the problems of a time series analysis (10 marks)

b) Briefly give the components of time series, their causes and uses (10 marks)

QUESTION THREE

a) Briefly describe the linear trend equation(2 marks)

b) The table below shows the annual production of a company by wood product since 1993.

Year	1993	1994	1995	1996	1997	1998	1999	2000
Production('000)	4	5	8	10	9	11	14	12

   i. Plot the production data on a graph (5 marks)
   ii. Determine the equation of a linear trend (3 marks)

c) Describe the steps followed in sampling design (5 marks)

d) State and describe the methods in sampling design (5 marks)

QUESTION FOUR

a) Define the following terms
   i. Real income (2 marks)
   ii. Purchasing power of a dollar (2 marks)
   iii. Deflated sales(2 marks)

b) Differentiate between consumer price index and producer price index (4 marks)

c) The following table gives information on the Consumer Price Index (CPI) and the monthly take home pay of Mr. Bryan an Employee at the jeep corporation.

Year 1982-84	CPI (1982-84)= 100	Mr. Bryan's monthly take home pay
1982-84	100	$ 600
1997(Sept)	131.8	2000

a) What is the purchasing power of the dollar for Sept 1997 based on the period 1982-84?(4 marks)

b) Determine Mr. Bryan's real monthly income for each of the time periods(6 marks)

QUESTION FIVE

a) Define Moving Average(2 marks)

b) List the methods of measuring seasonal variations(6 marks)

c) Below is a table showing total sales of beer product in a club (thousands)

Year	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Sales	15	16	20	23	19	25	30	35	24	28

i. Calculate a seven year moving averagefor the data given(8 marks)

ii. Plot the sales and moving averages on a graph(4 marks)

QUESTION SIX

a) Define the following terms

i. Price index (2 marks)

ii. Fisher's ideal price index (2 marks)

b) The prices of selected items for 1980 and 1999 follow. Production figures for those two periods are also given:

	PRICE		QUANTITY	
ITEM	**1980**	**1999**	**1980**	**1999**
Aluminum(cents per pd)	0.287	0.76	1,000	1,200
Natural gas(1,000 cu.ft)	0.17	2.50	5,000	4,000
Petroleum(barrel)	3.18	26.00	60,000	60,000
Platinum(troy ounce)	133.00	490.00	500	600

i. Compute a simple price index for each year of the four items. Use 1980 as the base period.(4 marks)

ii. Compute Laspeyres' price index for 1999,using 1980 as the base year(3 marks)

iii. Compute Paasche's index for 1999 using 1980 as the base year.(3 marks)

iv. Determine fisher's ideal index, using values for the Laspeyres and Paasche indexes computed in the two previous problems.(4 marks)

v. Determine a value index for 1999, using 1980 as the base year.(2 marks)