RAJARATA UNIVERSITY OF SRI LANKA
FACULTY OF APPLIED SCIENCES

B.Sc. (General) Degree in Applied Sciences
Third Year - Semester II Examination – October/November 2017

MAT 3204 - INDEX NUMBER

Time: Two (02) hours

Answer **all** questions.

Calculators will be provided.

1. In the following multiple-choice questions, select the best answer.

   a) An Index Number is used:
      i. To measure changes in quantity.
      ii. To measure the changes in a variable over time.
      iii. To measure changes in price.
      iv. To measure changes in demand.

   b) Index Numbers can be used for
      i. Forecasting ii. Fixed prices ii. Different prices v. Constant prices

   c) The ration of a new price to the base year price is called the:
      i. Price absolute ii. Price increase iii. Price decrease iv. Price relative

   d) This index measure the changes from month to month in the cost of a representative 'basket' of goods and services of the type bought by a typical household:
      i. Paasche price index ii. Laspeyeres price index iii. Financial time index
      iv. Retail price index

   e) The Laspeyers and Paasche index are example of:
      i. Weighted quantity index only ii. Aggregate index numbers
      iii. Weighted price index only iv. Weighted index numbers

f) The formula $\frac{\sum P_0 Q_1}{\sum P_0 Q_0} \times 100$ is used to calculate:

i. Paasche price index ii. Paasche quantity index
iii. Laaspeyres price index iv. Laspeyres quantity index

g) The formula $\frac{\sum P_1 Q_1}{\sum P_0 Q_1} \times 100$ is used to calculate:

i. The Laspeyres quantity index ii. The Paasche quantity index
iii. The Paasche price index iv. The Laspeyres price index

h) Index number calculated by Fisher's formula is ideal because it satisfy:

i. Circular test ii. Time reversal test
iii. Factor reversal test iv. All of the above

i) When relative change is measures for a fixed period, it is called:

i. Chain base method ii. Fixed base method
iii. Simple aggregative method iv. Cost of living index method

j) The chain base indices are not suitable for:

i. Long range comparisons ii. Short range comparisons
iii. Ratios iv. Percentages

k) An index number constructed to measure the relative change in the price of an item or a group of items is called:

i. Quantity Index number ii. Price index number ii. Volume index number
iv. Difficult to tell

l) Fisher's ideal index number is the geometric mean of the:

i. Laspeyre's and Marshall Edgeworth indices ii. Laaspeyre's and Paasche's indices
iii. Paasche's and Marshall Edgeworth indices iv. All of the above

m) While computing a weighted index, the current period quantities are used in the

i. Laspeyre's method ii. Paasche's method iii. Marshall Edgeworth method
iv. Fisher's Ideal method

n) Laspeyre's index=120, Paasche's index =145,then Fisher's Ideal index is equal to :

i. 125 ii. 135 iii. 132 iv. 142

o) The best average in the construction of index number is:

i. Median ii. Mode iii. Geometric mean iv. Arithmatic mean

p) The circular test is satisfied by:

i. Simple Aggregate index ii. Paasche's index ii. Laspeyer's index
iv. Fisher's Index

q) Symbolically $P_{01} \times P_{10} = 1$ stands for:

i. Circular test ii. Factor reversal test iii. Time reversal test
iv. None of these

r) A technique to link two or more index number series is known as

i. Splicing ii. Base shifting iii. Deflating iv. None of these

s) The price level of a country in a certain year has increased 20% over the base period. The index number is:

i. 20 ii. 120 iii. 220 iv. None of these

t) The general form of $P_{ab} \times P_{bc} \times P_{ca} = 1$ symbolically stands for:

i. Time reversal test ii. Factor reversal test iii. Circular test iv. Unit test

(100 marks)

2.

a) What is an Index Number? **(10 marks)**

b) Briefly describe the three characteristics of Index Numbers. **(10 marks)**

c) Distinguish between chain base index and fixed base index numbers.

(10 marks)

d) From the following data calculate price index numbers using fixed base method by taking 1985 as base year.

Year	1985	1986	1987	1988	1989	1990	1991
Price	50	60	62	65	70	78	95

(15 marks)

e) Using the fixed base indices obtained in part (iv), construct a new index number series in which the base is shifted to 1988. **(15 marks)**

f) From the following data calculate price index numbers using chain base method.

Commodity	2001	2002	2003	2004	2005
A	20	30	40	20	70
B	30	60	90	40	30
C	40	120	200	80	160
D	50	70	180	110	220

(20 marks)

g) Calculate the Fixed base index numbers from the chain base index numbers given below.

Year	20002	2003	2004	2005	2006	2007
Chain Base Index	94	104	104	93	103	102

(20 marks)

3.

a) What are the classifications of constructing Index Numbers? Describe briefly.
(20 marks)

b) Prove that Fisher's Ideal Index Number formula satisfies the Time Reversal Test.
(20 marks)

c) Prove that Laspeyre's and Paasche's Index Number formulas are not satisfied the Factor reversal test. **(20 marks)**

d) A construction company is interesting in knowing the price index number for the relative construction material used over the period. The following table gives the price of the material using the year 2000(base year) 2005 current year.

Item Units	2000		2005	
	Price	Quantity	Price	Quantity
A	2.00	4000	2.50	4500
B	5.00	500	4.00	800
C	1.50	1500	2.00	900
D	10.00	250	12.00	260
E	8.00	2500	5.50	5000

i. Simple aggregative method. **(10 marks)**

ii. Average-of-relative price index with arithmetic mean.
(10 marks)

iii. Weighted aggregated price index using Laspeyre's formula.
(10 marks)

iv. Weighted aggregated quantity index using Paasche's formula.
(10 marks)

4.

i. Explain the term "Splicing". **(20 marks)**

ii. The following table represents 2 hypothetical series of price indices. One computed for group of commodities for years 1970 to 1975 with the base year being 1970 and the other computed beginning in 1975 for a revised group of commodities. Thus, 1975vis the overlapping year for which both indices were determined.

Year	Old Price Index	Revised Price Index
1970	100	
1971	115	
1972	125	
1973	130	
1974	145	
1975	150	100
1976		110
1977		140
1978		155
1979		162
1980		175

Splice the two series of Index Numbers. **(40 marks)**

iii. The prices of a certain commodity in 5 years are given below. Construct the index numbers by Average Base Method.

Year	Price
2003	80
2004	110
2005	120
2006	90
2007	140

(40 marks)

END