RAJARATA UNIVERSITY OF SRI LANKA

FACULTY OF APPLIED SCIENCES

B.Sc. (General) Degree in Applied Sciences

Third Year -Semester II Examination – July 2020

MAT 3204– INDEX NUMBERS

Time: Two (2) hours

Answer All Questions

Calculators will be provided

01. Write short answers to the following questions.

i. Write down three (3) uses of index numbers.

ii. What are the limitations of index numbers?

iii. What main problems will arise when you construct index numbers?

iv. State types of index numbers and base years.

v. Distinguish between chain base and fixed base index numbers.

vi. State two important reasons for **shifting the base** year.

vii. Define **splicing** of index numbers.

viii. State the four (4) types of test of adequacy of index number formula.

ix. What are the two methods of construction of consumer price index (CPI)?

x. What is the importance of CPI?

(100 marks)

02. **(A)** Use the data available in the table to answer the following questions.

Year	Price
2010	100
2011	121
2012	129
2013	134
2014	146
2015	148
2016	151
2017	155
2018	159

i. Construct index numbers using the chain base method.

ii. Construct index numbers using the fixed base method considering 2010 as the base year. Again, find out new index numbers for the base year 2013.

iii. First calculate the price relatives using average price, and then calculate the link relatives using the calculated price relatives.

(50 marks)

(B) Convert the following chain base index numbers into fixed base index numbers.

Year	Chain base index
2015	98
2016	114
2017	145
2018	137
2019	158

(20 marks)

(C) Following table shows two series X and Y, which have been developed considering 2010 and 2015 as the base years.

Years	Index series X	Index series Y
2010	100	
2011	111	
2012	123	
2013	129	
2014	132	
2015	135	100
2016		132
2017		144
2018		154
2019		162

i. Splice the index series of X to Y.

ii. Splice the index series of Y to X.

(30 marks)

03. **(A)** Choose the most appropriate answer.

i. If the laspeyres- price index and the paasche- price index numbers are equal to 96.4%, and 99.1%, respectively, then the calculation of the fisher- price index is .....

a) unnecessary.

b) necessary and its value is 100.5%.

c) necessary and its value is 97.8%.

ii. Both laspeyres-index number and Paasche- index number are the weighted average of the .....

a) simple index numbers.

b) aggregate value data.

c) value index numbers.

iii. In the aggregate form of the aggregate quantity index the weights are .....

a) the value data of the base period.
b) the value data of the current period.
c) the price data.

iv. If the price index of bananas was 100 in 2019 and that for apples was 110, then the price of a 1 kg of bananas was .....

a) less than for apples.
b) more than for apples.
c) impossible to compare.

v. If the prices of different milk products in a shop are changed by -20%, +35%, +21%, -32% and +45% in 2018 and -34%, -23%, +12%, +19% and +22% in 2019, then the simple aggregative price index can be .....

a) 127.68%.
b) 101.08%.
c) 110.68%.
d) None of the above.

(40 marks)

(B) Use the data available in the following table to construct the price index for each of the methods given below.

Commodities	Price (2018)	Price (2019)	Quantity (2018)	Quantity (2019)
Milk	1260	3150	5	7
Flour	420	270	7	3
Sugar	810	720	9	8
Tea	1000	570	10	6
Coffee	568	600	4	4

i. Laspeyre's method

ii. Fisher's method

iii. Dorbish and Bowley's method(s)

iv. Marshall and Edgeworth method(s)

(60 marks)

04. **(A)** Show that the fisher's index number satisfies both time reversal test and factor reversal test.

(20 marks)

(B) Consider the given price indices to answer the following questions:

Price index	Year
69	2017
97	2018
100	2019
121	2020
137	2021

a) Which year is likely to be the base year?

b) What is the inflation rate from 2017 to 2020?

c) If the cost of market basket of goods and services in 2019 is Rs 5500, what is the cost of the same basket in 2020 and in 2021?

(25 marks)

(C) The consumer price index was 144.1 in 2018 and it was 133.9 in 2019. What is the inflation rate between 2018 and 2019? Discuss your answer.

(10 marks)

(D) Calculate consumer price index (CPI) basket and CPI for 2 Laptops, 5 calculators, 3 mobile phones and 1 printer for each year.

	Prices per one item in Rupees			
Year	Laptop	Calculator	Mobile phone	printer
2017	65000	2400	7000	24000
2018	76000	2900	6000	32000
2019	97000	3200	5500	29000

(45 marks)

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