D 70365 (Pages : 2) Name.....

Reg. No.....

FIFTH SEMESTER B.Sc. DEGREE EXAMINATION, NOVEMBER 2019

(CUCBCSS—UG)

Statistics

STS 5D 01—ECONOMIC STATISTICS

Time : Two Hours Maximum : 40 Marks

Use of Calculator is permitted.

Section A

Answer all the **five** *questions.*
Each question carries 1 *mark.*

1. A time series is a set of values arranged in ———— order.
2. For additive model, the sum of the seasonal indices is ————.
3. Index numbers are expressed in ————
4. Consumer price index is also known as ————.
5. Family budget method is also known as ————.

(5 × 1 = 5 marks)

Section B

Answer all the **five** *questions.*
Each question carries 2 *marks.*

6. Discuss the multiplicative model of a time series.
7. Give the names of different methods of measuring trend.
8. How can one find indices by the chain-base method ?
9. Discuss time reversal test.
10. Given the trend equation $y = 108 + 2.88x$, with origin 1980 and yearly data given from 1980 to 1992. Obtain the monthly trend equation.

(5 × 2 = 10 marks)

Turn over

$$p_{01} \times q_{01} = \sqrt{\frac{\sum p_1 q_0}{\sum p_0 q_0} \times \frac{\sum p_1 q_1}{\sum p_0 q_1}} \times \sqrt{\frac{\sum q_1 p_0}{\sum q_0 p_0} \times \frac{\sum q_1 p_1}{\sum q_0 p_1}} = \frac{50}{42} = \frac{\sum p_1 q_1}{\sum p_0 q_0}$$

Section C

Answer any **three** *questions.*
Each question carries 5 *marks.*

11. Explain the procedure of fitting a straight line trend equation by the method of least squares.
12. What are the advantages and disadvantages of the moving average method ?
13. Discuss various problems involved in the construction of index numbers.
14. Distinguish between Laspeyre's and Paasche's index numbers.
15. What purpose is served by consumer price index?

(3 × 5 = 15 marks)

Section D

Answer any one out of **three** *questions.*
Each question carries 10 *marks.*

16. Fit a straight line trend for the following data by least square method. Also estimate the values for the years 1998 and 1999.

Year :	1990	1991	1992	1993	1994	1995	1996
Value :	12	15	20	24	32	40	45

17. Compute Fisher's ideal index from the following data and show that it satisfies the factor reversal test.

Commodity	*Price*		*Quantity*	
	Base year	*Current year*	*Base year*	*Current year*
A	5	8	10	1
B	6	24	18	3
C	8	11	8	1
D	3	12	6	4

18. Calculate seasonal indices by the method of link relatives for the following data.

Quarters	*Year*				
	I	II	III	IV	V
A	45	48	49	52	60
B	54	56	63	65	70
C	72	63	70	75	86
D	60	56	65	72	86

(1 × 10 = 10 marks)

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Answer Key

1. Chronological
2. Zero
3. Percentages
4. Cost of living index
5. Method of weighted relatives
6. Model - 1 mark, Explanation - 1 mark.
7. Free hand method, Semi-average method, Method of moving averages and Method of least squares.
8. Chain index $= \frac{P.C.I \times C.L.R.}{100}$ where P.C.I = Previous year chain index and C. L. R. = Current year link relative - 2 marks
9. Explanation - 2 marks.
10. $y = 9 + 0.24x$ - 2 marks.
11. Explanation - 5 marks.
12. Any 5 problems- 5 marks.
13. Explanation - 5 marks.
14. Definitions - 2.5 marks each.
15. Advantages - 5 marks.
16. $\sum y = 188$, $\sum x = \sum (t - 1993) = 0$, $\sum x^2 = 28$, $\sum xy = 161$.
    The equation is $y = ax + b$. Thus the required equation is $y = 5.75x + 26.85$.
    The trend values are 9.6, 15.35, 21.1, 26.85, 32.6, 38.35 and 44.1.
    The estimated values for 1998 and 1999 are 55.6 and 61.35 respectively.
17. Here $\sum p_0q_0 = 42$, $\sum p_1q_0 = 57$, $\sum p_0q_1 = 43$, $\sum p_1q_1 = 55$.
    Fisher's index number $p_{01} = \sqrt{\frac{\sum p_1q_0}{\sum p_0q_0} \times \frac{\sum p_1q_1}{\sum p_0q_1}} \times 100 = 131.75$.
    $p_{01} \times q_{01} = \sqrt{\frac{\sum p_1q_0}{\sum p_0q_0} \times \frac{\sum p_1q_1}{\sum p_0q_1}} \times \sqrt{\frac{\sum q_1p_0}{\sum q_0p_0} \times \frac{\sum q_1p_1}{\sum q_0p_1}} = \frac{55}{42} = \frac{\sum p_1q_1}{\sum p_0q_0}$.