18STU02

PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)
BSc DEGREE EXAMINATION DECEMBER 2019
(First Semester)

Branch-STATISTICS

TIME SERIES AND INDEX NUMBERS

Time: Three Hours   Maximum: 75 Marks

SECTION-A (10 Marks!

Answer ALL questions
ALL questions carry **EQUAL** marks   (1 0 x 1 = 10)

1 A time series consist of_____ components.
(i) two (ii) three (iii) four (iv) five

2 The component of a time series which is attached to short-term fluctuations is
(i) seasonal variation (ii) cyclic variation
(iii) irregular variation (iv) all the above

3 The best method for finding out seasonal variation is
(i) simple average method (ii) ratio to moving average method
(iii) ratio to trend method (iv) trend method

4 In ratio to moving average method for seasonal indices, the ratio of an observed value to the moving average removes the influence of
(i) trend and irregular variation (ii) trend and cyclical variation
(iii) irregular and cyclical variation (iv) trend

5 One of the limitations in the construction of index number is
(i) the choice of the type of average (ii) choice of investigators
(iii) choice of variables to be studied (iv) choice of industry production

6 Index numbers are expressed in
(i) Percentages (ii) ratios (iii) absolute value (iv) variance

7 Laspeyre’s index formula uses the weights of
(i) base year (ii) current year
(iii) average of the weights of a number of years (iv) given year

8 Fisher’s ideal formula does not satisfy
(i) time reversal test (ii) circular test
(iii) unit test (iv) factor reversal test

9 Nation Income is_____ .
(i) Education (ii) Transport (iii) Increase in Price (iv) Financial data

10 The method adopted to measure national income is
(i) Product (ii) Laspeys’s (iii)Fisher’s (iv) Paasche’s

SECTION - B (35 Marks)

Answer ALL Questions
ALL Questions Carry **EQUAL** Marks (5 x 7 = 35)

11 a Explain the uses of Time Series.

OR

b Explain briefly the additive and multiplicative time series models with an example.

12 a Compute seasonal indices by the link relatives method for the following data:

"^"^Year Quarter'\.^	1996	1997	1998	1999	2000
I	30	35	31	31	34
II	26	28	29	31	36
III	22	22	28	25	26
IV	36	36	32	35	"n

12 Cont...
b Write short notes on cyclical variations.

13 a What are the basic problems involved in constriction of index numbers?

OR

b From the chain base index numbers given below, obtain the fixed base index numbers:

Year	Chain indices
2001	105
2002	75
2003	71
2004	105
2005	95
2006	90

14 a Construct the cost of living index number from the following group cata:

Group	Group Index Number for a given year	Weights
Food	247	47
Clothing	293	7
House Rent	289	8
Fuel and Lighting	100	13
Miscellaneous	236	14

OR

b Write down the various steps involved in the construction of cost of living index number

15 a Explain the product method of estimation of national income.

OR

b Define national income and state its uses.

SECTION - C (30 Marks!

Answer any **THREE** Questions

ALL Questions Carry **EQUAL** Marks ($3 \times 10 = 30$)

16 Below are given the figures of production (in thousand tones) of a fertilizer factory.

Year	1995	1997	1998	1999	2000	2001	2004
Production ('000 tonnes)	77	88	94	85	91	98	90

Fit a straight line by the least square methoc and tabulate the trend values.

17 Calculate the seasonal indices from the following data using the moving average method:

Year	I Quarter	II Quarter	III Quarter	IV Quarter
2001	72	68	80	70
2002	76	70	82	74
2003	74	66	84	80
2004	76	74	84	78
2005	78	74	86	82

18 Explain the weighted average and unweighted index numbers with suitable illustration.

19 Using the following data, construct Fisher's ideal index ad show how it satisfies Factor Reversal test and Time Reversal test.

Commodity	Price in rupees per unit		Number of units	
	Base Year	Current Year	Base Year	Current Year
A	6	10	50	56
B	2	2	100	120
C	4	6	60	60
D	10	12	24	24
E	8	12	36	36