PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)
BSc DEGREE EXAMINATION MAY 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 (10 x 1 = 10)

1 If time series consists of _____.
(i) two components (ii) four components
(iii) three components (iv) five components

2 Secular trend is indicative of long term variation towards _____.
(i) increase only (ii) either increase or decrease
(iii) decrease only (iv) none

3 A group for moving average consists of _____.
(i) 5 years period (ii) a period which forms a cycle
(iii) 3 years period (iv) 4 years period

4 Seasonal Variation means the variations occurring within _____.
(i) a number of years (ii) parts of a month
(iii) parts of a year (iv) none

5 Index numbers are expressed _____.
(i) in percentages (ii) in terms of absolute value
(iii) in ratios (iv) none

6 Unweighted price index formula to _____.
(i) most frequently used (ii) the best
(iii) seldom used (iv) all the above

7 Laspeyre's index formula uses the weights of the _____.
(i) base year (ii) average of the weights of a number of years
(iii) current year (iv) none

8 Factor reversal test was invented by _____.
(i) Walsh (ii) John.J.Giriffin (iii) A.2 Bowley (iv) Irving Fisher

9 The net value of GDP after deducting depreciation from GDP is _____.
(i) Net National Product (ii) Net domestic product
(iii) Gross national product (iv) Disposable income

10 The value of national income adjusted for inflation is called _____.
(i) Per Capital Income (ii) Inflation Rate
(iii) Disposable Income (iv) Real National Income

SECTION - B (25 Marks)
Answer **ALL** questions
ALL questions carry **EQUAL** Marks (5 x 5 = 25)

11 a Describe additive and multiplication models of time series.

OR

b Find the trend of annual sales of a trading organization by moving average method.

Year	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973
Annual Sales (Rs. in '000)	80	84	80	88	98	92	84	88	80	100

12 a Explain about link relative method.

OR

b Calculate seasonal indices by the ratio to moving average method from the following data.

Year / Quarter	1980	1981	1982	1983
Q_1	75	86	90	100
Q_2	60	65	72	78
Q_3	54	63	66	72
Q_4	59	80	85	93

13 a Explain about calculation of index numbers.

OR

b Construct the whole sale price index number for 1982 and 1983 from the data given below. Using 1981 as the base year whole sale price in rupees per quintal.

Commodity	1981	1982	1983
A	140	160	190
B	120	130	140
C	100	105	108
D	75	80	90
E	250	270	300
F	400	420	450

14 a Prepare price and Quantity Number index and quantity index number for 1983 with 1982 as base year from the following data by using
(i) Laspeyre's, (ii) Paashe's, (iii) Marshall-Edgeworth and (iv) Fisher's method.

Year	Article I		Article II		Article III		Article IV	
	Price	Qty	Price	Qty	Price	Qty	Price	Qty
1982	5.00	5	7.75	6	9.63	4	12.50	9
1983	6.50	4	8.80	10	7.75	6	12.75	9

OR

b Explain briefly about main steps in the construction of cost of living index number.

15 a Given short notes on major use of National Income estimates.

OR

b Write any five computational difficulties in India.

SECTION -C (40 Marks)

Answer **ALL** questions

ALL questions carry **EQUAL** Marks (5 x 8 = 40)

16 a For the following series of observations, verify that the 4-year centered moving average is equivalent to a 5 year weighted moving average with weights 1,2,2,2,1 respectively.

Year	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983
Annual Sales (Rs.000)	2	6	1	5	3	7	2	6	4	8	3

OR

b Describe about Moving Average methods.

17 a Apply ratio to moving average method to ascertain seasonal indices from the following data.

Year and month 1981	No.of Persons visiting a place of interest	Year and month 1982	No.of Persons visiting a place of interest	Year and month 1983	No.of Persons visiting a place of interest
Jan	90	Jan	100	Jan	110
Feb	80	Feb	89	Feb	93
Mar	70	Mar	74	Mar	78
April	60	April	62	April	66
May	55	May	55	May	58
June	45	June	47	June	40
July	30	July	30	July	35
Aug	40	Aug	43	Aug	45
Sept	70	Sept	65	Sept	72
Oct	120	Oct	127	Oct	130
Nov	115	Nov	118	Nov	118
Dec	118	Dec	120	Dec	124

OR

b Explain about ratio to moving average method.

18 a Explain detailed about problems involved in the construction of index number.

OR

b Explain about (i) construction of cost of living index
(ii) uses of cost of living index number.

19 a Explain about Laspeyre's, Passche's, Fisher's, Kelly's and Marshall Edgeworth index number.

OR

b The price quotations of four different commodities for 1976 and 1982 are given below. Calculate the index number for 1982 with 1976 with as base by using (i) the simple average of price relatives and
(ii) the weighted average of price relatives.

Commodities	Unit	Weight (Rs.'000)	Price in (Rs.)	
			1976	1982
A	Kg	5	2.00	4.50
B	Quintal	1	2.50	3.20
C	Dozen	6	3.00	4.50
D	kg	2	1.00	1.80

20 a Explain the methods of measurement of National Income.

OR

b Discrept about National Income.

Z-Z-Z END