PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)
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. BSc DEGREE EXAMINATION MAY 2017
(Second Semester)

Branch- STATISTICS

TIME SERIES & INDEX NUMBERS

Time : Three Hours   -   Maximum : 75 Marks

SECTION-A (20 Marks)
Answer **ALL** questions
ALL questions carry **EQUAL** marks   (10 x 2 = 20)

1   What are the components of a time series?

2   Give multiplicative model for time series.

3   State the methods for measuring seasonal variations.

4   , What is meant by deseasonalization?

5   Give any two uses of index numbers.

6   State any two merits of the chain base method.

7   Write the formula for Marshall - Edge worth price index number.

8   What is Fisher's ideal index number?

9   What do you mean by national income?

10   State any two uses of National Income.

SECTION - B (25 Marks)
Answer **ALL** Questions
ALL Questions Carry **EQUAL** Marks (5 x 5 = 25)

11 a Fit a trend line to the following data by the method of semi-averages:

' Year:	2008	2009	2010.	2011	2012	2013	2014
Sales of Firm A ('000 units):	102	105	114	110	108	116	112

<center>OR</center>

  b Write merits and limitations of the method of moving averages.

Assuming that trend is absent, determine if there is any seasonality in the data given below:

Year	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter
2011	3.7	4.1	3.3	• 3.5
2012'	3.7	3.9	3.6	3.6
2013	4.0	4.1	.3.3	3.1
2014	3.3	4.4	4.0	4.0

What are the seasonal indices for various quarters?

<center>OR</center>

Explain ratio - to trend method.

Construct index numbers of price from the following data by applying (i) Laspeyre's and (ii) Paasche's method.

Commodity	2010		2011	
	Price	Quantity	Price	Quantity '
A	20	8	40	6
B	50	10	60	'5
C	40	15	50	15
D	20	20	20	25

<center>OR</center>

Calculate the cost of living index number using the weighted geometric mean

Group	Index number	Weights
Food	350	10
Flue and lighting	150	2
Clothing	200	2
House rent	150	2
Miscellaneous	225	4

From the following data construct an index for 2012 taking 2011 as base:

Commodity	A	B	C	D	E
Price in 2011 (Rs.)	50	40	80	110	20
Price in 2012 (Rs.)	70	60	90	120	20

OR

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

Year:	2000	2001	2002	2003	2004	2005
Chain indices:	105	75	71	105	95	90

Explain the Computational difficulties in India.   -   . V .

OR

State the uses of National Income.

SECTION - C (30 Marks)
Answer any THREE Questions
ALL Questions Carry EQUAL Marks (3 x 10 = 30)

Below are given the figures of production (in thousand tonnes) of a fertilizer factory:

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

Fit a straight line by the 'Least square method' and tabulate the trend values.

Compute the seasonal indices by the 'Link relatives method for the following data relating to the average quarterly prices (Rs. per kg) of a commodity for five years:

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	33

Explain the construction of wholesale price index numbers and state its uses.

Prepare price and quantity index numbers for 2005 with 2002 as base year from the following data by using (i) Laspeyre's and (ii) Paasche's method. Also verify that factor reversal test is satisfied by Fisher's formula.

Year	Article I		Article II		Article III		Article IV	
	Price	Qty	Price	Qty	Price.	Qty	Price	Qty
2002	5	5	7.75	6	9.63	4	12.50	9
2005	6.50	7	8.80	10	7.75	6	12.75	9

Explain estimation methods in national income.