One Two academy

Maximum Marks: 45 Applied Statistics Duration: 90 minutes

Std 12 Business Mathematics and Statistics

Answer the following:

5 x 1 = 5

- A decline in sale of ice cream during November to March is associated with

 a) seasonal variation b)cyclical variation c) random variable d)secular trend
- 2. What is true ratio?
- 3. Which is the most exact method of fitting a trend?
- 4. Mention the two causes of variation.
- 5. List any 2 factors that are responsible for seasonal variation.

Answer any four of the following

4 x 2 = 8

1. Fit a trend line by the method of free hand method for the given data

Year	2000	2001	2002	2003	2004	2005	2006
Sales	46	25	59	37	40	60	38

- 2. Mention the uses of cost of living index number.
- 3. A machine drills hole in a pipe with a mean diameter of 0.532 cm and a standard deviation of 0.002 cm. Calculate the control limits for mean of samples 5.
- 4. Laspeyre's Index = 110, Paasche's Index = 108, then calculate Fisher's Ideal Index.
- 5. The following are the group index numbers and the group weights of an average working class family's budget. Construct the cost of living index number:

Groups	Food	Fuel and Lightning	Clothing	Rent	Miscellaneous
Index No	2450	1240	3250	3750	4190
Weights	48	20	12	15	10

Answer any four of the following

4 x 3 = 12

1. Construct the cost of living index number for 2011 on the basis of 2007 from the given data using family budget method.

Commodities	Price 2007	Price 2011	Weights
А	350	400	40
В	175	250	35
С	100	115	15
D	75	105	20
E	60	80	25

2. The annual production of a commodity is given as follows:

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Year	1995	1996	1997	1998	1999	2000
Production(in	155	162	171	182	158	180
tonnes)						

3. Calculate price index number for 2005 by Laspeyre's Index

Commodity	Price 1995	Quantity 1995	Price 2005	Quantity 2005
А	5	60	15	70
В	4	20	8	35
С	3	15	6	20

4. Calculate price index number for 2005 by Paasche's Index

Commodity	Price 1995	Quantity 1995	Price 2005	Quantity 2005
А	5	60	15	70
В	4	20	8	35
С	3	15	6	20

5. Find the trend of production by the method of a five-yearly period of moving average for the following data:

5	
Year	Production (in thousands)
1979	126
1980	123
1981	117
1982	128
1983	125
1984	124
1985	130
1986	114
1987	122
1988	129
1989	118
1990	123

Answer any four of the following

4 x 5 = 20

- 1. Define time series. What is the need for studying time series? State the uses of time series. Mention the components of time series.
- 2. Determine the equation of a straight line which best fits the following data

Year	2000	2001	2002	2003	2004
Sales (in	35	36	79	80	40
thousands)					

Compute the trend values for all the years from 2000 to 2004.

3. Calculate the seasonal indices from the following data using the average from the following data using the average method:

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Year	1 st Quarter	2 nd Quarter	3 rd Quarter	4 th Quarter
2008	72	68	62	76
2009	78	74	78	72
2010	74	70	72	76
2011	76	74	74	72
2012	72	72	76	68

4. Using the following data, construct Fisher's Ideal index and show how it satisfies Factor Reversal Test and Time Reversal Test?

			1	
Commodity	Base year	Current year	Base year	Current year
	price	price	quantity	quantity
А	6	10	50	56
В	2	2	100	120
С	4	6	60	60
D	10	12	50	24
E	8	12	40	36

5. In a production process, eight samples of size 4 are collected and their means and ranges are given below. Construct mean chart and range chart with control limits.

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Sample	1	2	3	4	5	6	7	8
number								
x	12	13	11	12	14	13	16	15
R	2	5	4	2	3	2	4	3

Table of Control Chart Constants

Sample size	A2	D3	D4
4	0.729	0	2.282