Reg. No ....   Name **23U150-S**

Time : Three Hours   Max. Marks: 75

Use of Scientific calculators and Statistical tables permitted
PART A
Answer all questions. Each question carries 1 mark.

1.   If the s.d. of X is 5, find the s.d. of X/2 ?
2.   If the arithmetic mean of 4 observations is 6,what is the new arithmetic mean if 3 is subtracted from each of the observations?
3.   What is time series analysis?
4.   Write the normal equations for fitting a line of the form y = ax+b.
5.   There were 500 workers working in a factory. Their mean wage was calculated as Rs.200. Later on it was discovered that the wages of two workers were misread as 180 and 20 instead of 80 and 220. Find the correct mean.
6.   The standard deviation of 1,2,3,…n is $\sqrt{14}$;Find n?
7.   Increase of production in the first year is 3%,second year is 4% and third year is 5%. Find the average increase in production?
8.   What is Wholesale Price Index Number?
9.   What is the range of variation of the Bowley's measure of skewness?
10.   What is irregular variation?

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PART B
Each question carries 3 marks. Maximum marks from this part is 15

11.   Distinguish between skewness and kurtosis?
12.   For the given data calculate simple index number by simple aggregate method.

Commodity	Price in 2000	Price in 2010
A	17	22
B	30	34
C	13	14
D	15	15

13.   Prove that the sum of squares of deviations of observations is the minimum when deviations are taken from the arithmetic mean?
14.   Following are the daily wages of ten workers of a firm, find 6th decile and 40th percentile?
      120, 130, 140, 110, 160, 150, 190, 180, 170, 200
15.   Explain how will you use the principle of least squares in fitting of curves?

16. Calculate simple Index number by average price relative method by using both AM and GM.

Items	Price in the base year	Price in current year
A	5	7
B	10	12
C	15	25
D	20	18
E	8	7

17. In a frequency distribution the coefficient of skewness based on quartiles is 0.5. If the sum of upper and lower quartiles is 28 and the median is 11, find the values of lower and upper quartiles

PART C
Each question carries 5 marks. Maximum marks from this part is 20

18. Define A.M., G.M., and H.M. The arithmetic mean of two observations is 9, their G.M. is 7.2. find the two observations and also the H.M.?

19. Fit a trend line to the following data using free hand method

Year:	1991	1992	1993	1994	1995	1996
Profit:	40	42	40	48	52	49

20. What is curve fitting? Explain the method of fitting a curve of the form $y = ab^x$

21. What do you understand by skewness? How is it measured? Distinguish between positive and negative skewness.

22. Fit a straight line to the following data

X:	1	2	3	4	6	8
Y:	2.4	3	3.6	4	5	6

23. Explain Lorenz Cu

PART D
Each question carries 10 marks. Maximum marks from this part is 30

24. An analysis of the monthly wages paid to workers in two firms A and B, belonging to the same industry give the following results
    (a) Which firm A or B pays out the higher amount of monthly wages?
    (b) Which firm A or B has greater variability in individual wages?
    Find the average monthly wages and S.D of the wages of all the workers in two firms A and B taken together

	Firm A	Firm B
No.of wage earners	586	648
Average monthly wages	52.5	47.5
Variance of the distribution of wages	100	121

25. Calculate the Laspeyres, Paasche's and Fisher's Index Numbers for the following data. Show how they satisfies time and factor reversal tests?

commodity	Base Year		Current Year	
	Price	Quantity	Price	Quantity
A	6	10	50	56
B	2	2	100	120
C	4	6	60	60
D	10	12	30	24
E	8	12	40	36

26. Calculate coefficient of skewness based on mean and median from the following distribution

Class interval	0-10	10-20	20-30	30-40	40-50	50-60	60-70	70-80
frequency	6	12	22	48	56	32	18	6

27. Calculate the co-efficient of variation from the following data.

x : 1.0   1.5   2.0   2.5   3.0   3.5   4.0

f : 1.1   1.3   1.6   2.0   2.7   3.4   4.1