**M.A (PREVIOUS) EMAMINATION 2001**
**"ECONOMICS'.PAPER-III**
**(SDVANCED EONOMICS STASTISTICS)**

**Time allowed:  Three Hours.**                                              **Max. Marks: 100**

Instructions:  1) Attempt any FIVE questions.

2)  Marks are indicated against each question.

1.     Management of Kentucky Fried Chicken operating in Karachi pay their lower grade employees in U.S. $ on monthly basis as under:-

| WAGES | # OF WORKERS |
|-------|--------------|
| 120-135 | 10 |
| 135-150 | 22 |
| 150-165 | 25 |
| 165-180 | 32 |
| 180-195 | 48 |
| 195-210 | 33 |
| 210-225 | 22 |
| 225-240 | 16 |
| 240-255 | 12 |

(i)     Determine the mean and Variance wage.                    10

(ii)     Determine the geometric mean of wages.               7

(iii)     If workers drawing more than (X + S) wage are charged to tax, what is the lowest limit of wage to be taxed?                                        3

2.   for 10 observations given the following

$\sum x = 140$     $\sum_x^2 = 2118$   $\sum_x^3 = 34130$

Determine the following:

(i)     Three absolute moments.                          3

(ii)     Three true moments.                              6

(iii)     First two raw moments about 15 as origin.         8

(iv)     What are the values for the mean and variance?         3

3.   KESC bills its consumers on progressive rate.

For a sample of five house holds the units consumed (x) and the amount of bill in Rs (Y) are given below.

(i)     Find an equation to estimate the amount of bill as a function of units consumed.     8

(ii)     Determine the simple correlation

(iii)     Estimate the amount of bill for a consumer which consumed 550 units, x = 550

| X: | 300 | 500 | 600 | 700 | 1000 |
|----|-----|-----|-----|-----|------|
| Y: | 350 | 1200 | 1500 | 2000 | 3500 |

(iv)     State and prove the characteristic feature of correlation coefficient with respect to the addition and multiplication by a constant.                     5

4-a)   Describe sampling methodologies appropriate for                     12

(i)     A small population likes that of a Steel Mill.
(ii)    A big population likes that of the city of Karachi.
(iii)   A very big population likes that of Pakistan.
        b) Discuss the relative merits and demerits of a Census and sample survey-8

5-a)   a shipment of 15 monitors contains 4 defective monitors. In how many ways a cyber Cafe purchase 5 of these monitors and receives at most two defective monitors.  10

  b) In a single throw of an unbalanced dice the probability of an even number to occur is 5/8. 10
  If the dice is rolled 6 times, what is the probability of getting an odd number at least 4 times?

6-a)   what is an ideal index number? Explain how the base f an index number series can be shifted to a more recent period?                    8

  b) Construct paache's and Marshall Indices for 2001 with 2000 as base from the following data:   12

| ITEMS | PRICES | | QUANTITIES | |
|---|---|---|---|---|
|  | 2000 | 2001 | 2000 | 2001 |
| A | 15 | 18 | 10 | 8 |
| B | 10 | 12 | 8 | 10 |
| C | 20 | 25 | 5 | 4 |
| D | 22 | 25 | 12 | 15 |
| E | 25 | 30 | 6 | 10 |

7    (Fit a straight line trend to the data given below for the period 1991 to 2001). Also isolate the Seasonal component using a multiplicative model.

   220    225    232    247    249    250    254    258    265    275    300

8-a)    given below are the values of a function for some specified values of X, interpolate the value of the function for x = 11                               12

|  X: | 10 | 12 | 15 | 20 | 23 |
|---|---|---|---|---|---|
| F(x): | 1000 | 1728 | 3375 | 8000 | 12167 |

b) Given x:        10     12    18 20   23   25     28      (08)
   Determine the following:      -
   (i)      $\sum x^2$
   (ii)     $\sum (x - x)^2$
   (iii)    $\sum (x + 5)2$
   (iv)     $\sum (3x^2 - 5x + 10)$

   1.   Write short notes on any TWO of the following:      20
        (a) Skewness.
        (b) Sheppard's correction.
        (c) Principal of Least Squares.