SHRIMATHI DEVKUNVAR NANALAL BHATT VAISHNAV COLLEGE FOR WOMEN
(AUTONOMOUS)
(Affiliated to the University of Madras and Re-accredited with 'A+' Grade by NAAC)
Chromepet, Chennai - 600 044.
B.Com. CS - END SEMESTER EXAMINATIONS APRIL - 2024
SEMESTER - IV
21UBCCT4012 - Statistics - II

Total Duration : 2 Hrs. 30 Mins. Total Marks : 60

Section B

Answer any **SIX** questions $(6 \times 5 = 30$ Marks)

1. A group of 5 students took tests before and after training and obtained the following scores.

Scores before training	3	4	4	6	8
Scores after training	4	5	6	8	10

   Find by the method of least squares the straight line of best fit.

2. Compute the Karl Pearson's coefficients of correlation from the following data, using 20 as the working mean for the price and 70 as the working mean for demand:

Price	14	16	14	18	19	20	21	22	23
Demand	84	78	70	75	66	67	62	58	60

3. Explain the four components of time series.

4. Using three years moving averages determine the trend and short term fluctuations:

Year	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982
Production (tons)	21	22	23	25	24	22	25	26	27	26

5. List the properties and limitations of correlation coefficient.

6. Find the correlation coefficient between x and y and write down the equation of the regression lines from the following:
   n=25, $\sum$x =125, $\sum x^2$ =650, $\sum$xy =508, $\sum$y=100 and $\sum y^2$=460.

Contd...

7. Compute the seasonal index numbers applying the simple average method for the following data:

Year	Summer	Monsoon	Autumn	Winter
1981	112	110	120	115
1982	80	145	105	90
1983	95	100	140	80
1984	110	90	130	110
1985	85	110	110	90
1986	92	120	110	85

8. Calculate the cost of living index number using the weighted geometric mean:

Group	Index Number	Weights
Food	700	10
Fuel & Lighting	300	2
Clothing	400	2
House Rent	300	2
Miscellaneous	450	4

Section C

Answer any **THREE** questions $(3 \times 10 = 30$ Marks)

9. Fit a parabolic curve of regression of y on x to the nine pairs of values:

x	1	2	3	4	5	6	7	8	9
y	2	6	7	8	10	11	11	10	9

10. Ten competitors in a beauty contest are ranked by three judges in the following order:

First judge	1	4	6	3	2	9	7	8	10	5
Second judge	2	6	5	4	7	10	9	3	8	1
Third judge	3	7	4	5	10	8	9	2	6	1

Use the method of rank correlation coefficient to determine which pair of judges have the nearest approach to common taste in beauty?

11. For two variables X and Y the equations of the regression lines are 9Y-X-288=0 and X-4Y+38=0, find
    (i) The mean values of X and Y.
    (ii) The coefficient of correlation between X and Y.
    (iii) The ratio of the standard deviation of Y to that of X.
    (iv) The most probable value of Y when X=145.
    (v) The most probable value of X when Y=35.

Contd...

12. Using 4-quarter moving average in respect of the following data: find(i) trend, (ii) short-term fluctuations and (iii) seasonal variations.

Year	**1st quarter**	**2nd quarter**	**3^{rd} quarter**	**4th quarter**
1993	68	62	61	63
1994	65	58	66	61
1995	68	63	63	67

13. Calculate Fisher's Ideal Index from the following data and prove that it satisfies both the time reversal and factor reversal tests.

Commodities	**2002**		**2003**	
	Price	**Quantity**	**Price**	**Quantity**
A	8	16	10	16
B	10	20	12	24
C	6	12	8	14
D	16	10	20	8

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