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-2022
SEMESTER - IV
20UBCCT4012 - Statistics - II

Total Duration : 3 Hrs.   Total Marks : 60

Section A

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

1. Write a note on least square principle.

2. Two judges in a beauty competition rank the 12 entries as follows:

X	1	2	3	4	5	6	7	8	9	10	11	12
Y	12	9	6	10	3	5	4	7	8	2	11	1

What degree of agreement is there between the judgements of the two judges?

3. List out the regression equations, regression coefficients and regression lines.

4. Fit a trend line by the method of semi-averages for the data given below. Estimate the population for 2022.

Year	Population (in million)	Year	Population (in million)
2014	412	2018	470
2015	438	2019	482
2016	444	2020	490
2017	454	2021	500

5. Briefly explain the components of time series.

6. From the data given below construct Fisher's quantity index number:

Commodities	Base Year		Current Year	
	Quantity	Price	Quantity	Price
A	2	4	6	18
B	5	3	2	2
C	7	8	4	24

7. Write a note on time reversal test with a suitable example.

8. Demonstrate with an illustration for the test of differences between means under small sample.

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Section B

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

9. Explain the process of fitting a straight line trend.

10. Given the bivariate data:

X	1	5	3	2	1	1	7	3
Y	6	1	0	0	1	2	1	5

Fit a regression line of Y on X and then predict Y if X $= 5$.

11. Compute Fisher's Index Number for the following figures relate to the prices and quantities of certain commodities. Find out whether it satisfies the time reversal test:

Commodities	**Base Year**		**Current Year**	
	Quantity	**Price**	**Quantity**	**Price**
P	30	50	32	50
Q	25	40	30	35
R	18	50	16	55

12. Fit a straight line trend by the method of least squares to the following data:

Year	2015	2016	2017	2018	2019	2020	2021	2022
Earnings (Rs. Lakhs)	38	40	65	72	69	60	87	95

Assuming that the same rate of change continues, what would be the predicted earnings for the year 2023.

13. Four machines A, B, C and D are used to produce a certain kind of cotton fabrics. Samples of size 4 with each unit as 100 square metres are selected from the outputs of the machines at random, and the number of flaws in each 100 square metres are counted, with the following result:

A	**B**	**C**	**D**
8	6	14	20
9	8	12	22
11	10	18	25
12	4	9	23

Do you think that there is a significant difference in the performance of the four machines?

NOTE: F-Table Value for (3, 12) d.f. and 1% level of significance is 5.95.

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