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FOUR YEAR HONOURS B.Sc. DEGREE EXAMINATION,**DECEMBER -2024****CHOICE BASED CREDIT SYSTEM****THIRD SEMESTER MINOR****PART-II-STATISTICS****Paper -7: Statistical Methods***(Under CBCS New Regulation w.e.f the academic year 2024-25)***Max. Marks : 75****Time : 3 Hours****SECTION - A****Answer any five of the Following Questions. Each question carries equal marks
(5×5=25)**

1. Write the principle of least square method.
2. Write the normal equations of the parabola.
3. Show that correlation coefficient is independent of origin and scale.
4. Define correlation and also write the types of correlation.
5. Define coefficient of determination
6. Define probable error and standard error.
7. Explain linear regression.
8. Show that the geometric mean of two regression coefficient is a correlation coefficient.
9. Define order of class frequencies.
10. Define independence and association of attributes.

SECTION - B**Answer all questions. Each question carries equal marks.****(5×10=50)**

11. a) Fit a curve $y = ae^{bx}$ by the method of least squares.

(OR)

- b) Fit a curve of the type $y = ax^2 + bx + c$ for the following data.

X	1	2	3	4	5
Y	10	12	8	10	14

12. a) Calculate the correlation coefficient to the following data.

X	8	12	14	15	20	22	25
Y	12	15	24	36	41	52	60

(OR)

- b) Prove that $-1 \leq \rho \leq +1$

13. a) Find coefficient of correlation to the following data.

Year	1981	1982	1983	1984	1985	1986	1987
Supply	250	150	170	190	120	110	750
Demand	50	80	50	35	27	55	45

(OR)

- b) Define partial correlation coefficient and also write its properties.

14. a) State and prove any two properties of regression coefficients.

(OR)

- b) Find the two regression line of y on x for the following data.

X	1	2	3	4	5	6
Y	3	7	12	14	16	20

15. a) Derive the relation between the coefficient of association and the coefficient of

$$\text{Colligation. } \varpi Q = \frac{2Y}{1+Y^2}$$

(OR)

- b) Attributes A and B represents respectively regular morning walk activity and being Physically fit. Compute coefficient of association between the two attributes given that $N=100$, $(A)=60$, $(B)=50$, $(AB)=35$ and also interpret the result.