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(c) Find the coefficient of correlation between the value of X and Y:

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Unit—V
(a) Calculate the S. D. and coefficient of variation

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Roll No.

CD-2852

B. C. A. (Part I) EXAMINATION, 2020

(Old Course)

Paper Second

CALCULUS AND STATISTICAL METHODS

Time: Three Hours

Maximum Marks: 50

Note: Attempt any two parts from each question. All questions carry equal marks. Only simple calculator is allowed.

Unit-I

1. (a) Find the value of:

$$\lim_{x\to\infty} \left(1 + \frac{1}{x^2}\right)^2.$$

(b) Test for continuity of the following function at x = 0:

$$f(x) = \begin{cases} \frac{1 - \cos x}{x^2}, & x \neq 0 \\ 1, & x = 0 \end{cases}$$
and the following function of the following states are also as a function of the following states are also as a function of the following states are also as a function of the following states are also as a function of the function of

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(c) Evaluate right hand and left hand derivatives of the function:

$$f(x) = \begin{cases} x \tan^{-1} \left(\frac{1}{x}\right), & \text{when } x \neq 0 \\ 0, & \text{when } x = 0 \end{cases}$$

at x = 0. Is f(x) differentiable at x = 0?

- 2. (a) Find the differential coefficient of $\log \sin^{-1} x^4$.
 - (b) If:

$$\sin y = x \sin (a + y),$$

prove that:

$$\frac{dy}{dx} = \frac{\sin(a+y)}{\cos y - x\cos(a+y)}$$

(c) Find $\frac{dy}{dx}$, when:

$$x = a\cos^3 t$$

$$y = a \sin^3 t$$

Unit-III

3. (a) Find the points on the curve:

$$\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$$

the tangent at which are perpendicular to x-axis.

(b) Find the intervals in which the function:

$$f(x) = 2x^3 - 3x^2 - 36x + 40$$

in (a) strictly increasing (b) strictly decreasing.

(c) If x + y = 10, then find the maximum value of xy.

Unit-IV

- 4. (a) The odds against a certain event are 5 to 2 and the odds in favour of another event, independent of the former, are 6 to 5. Find the odds that one at least of the events will happen.
 - (b) A card is drawn from an ordinary pack of cards and a player bets that it is a spade or an ace. What are the odds against his winning the bet?
 - (c) If the chance of A, winning a certain race be $\frac{1}{6}$ and the chance of B winning it be $\frac{1}{8}$, what is the chance that neither should win?

Unit-V

5. (a) Calculate the S. D. and coefficient of variation (C. V.) for the following table:

Class	Frequency
0—10	5
10-20	10
20—30	20
30-40	40
40—50	30
\$ 0—60	20
6070	10
70—80	5

(b) Explain constants of the Poisson's distribution moments about the origin.