

J-262

B.C.A. (Part-I) Examination, 2021
(Theoretical Foundation of Computer Science)

Paper - II

CALCULUS AND STATISTICAL ANALYSIS

Time Allowed : Three Hours

Maximum Marks : 50

Minimum Pass Marks : 20

Note : Attempt any one question from each unit. All

questions carry equal marks.

Unit-I

Q. 1. Evaluate $\lim_{x \rightarrow \pi/2} (\sec x - \tan x)$.

OR

Q. 2. Test the continuity of the following function at $x = 1$:

$$f(x) = \begin{cases} 2x + 3 & , \text{ if } x < 1 \\ 2 & , \text{ if } x = 1 \\ 7 - 2x & , \text{ if } x > 1 \end{cases}$$

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Unit-II

Q. 3. Find the differentiation of the function x^{5x^3} .

OR

Q. 4. If $x^y = e^{y-x}$, then prove that :

$$\frac{dy}{dx} = \frac{2 - \log x}{(1 - \log x)^2}$$

Unit-III

Q. 5. Find the equation of normal of the curve $y^2 = 6x$ at the point whose ordinate is 12.

OR

Q. 6. Show that the maximum value of

$$\sin x + \cos x \text{ is } \sqrt{2}$$

Unit-IV

Q. 7. State and prove the additive law of probability.

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OR

- Q. 8.** A bag contains 5 black and 11 white balls. Find the probability to draw one white ball from the bag.

Unit-V

- Q. 9.** Find out the binomial distribution to be expected by tossing 4 coins 320 times.

OR

- Q. 10.** Calculate the co-efficient of correlation between X and Y :

X	1	3	5	7	8	10
Y	8	12	15	17	18	20
