I-262

B.C.A. (Part-I) Examination, 2020

(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. Prove that : **10**

$$\lim_{x \to -1}\left(2x^2 + 3\right) = 5$$

OR

Test the following function for continuity at x = 0 :

$$f(x) = \begin{cases} x\sin\dfrac{1}{x} & \text{when} \quad x \neq 0 \\ 0 & \text{when} \quad x = 0 \end{cases}$$

Unit-II

Q. 2. $x = \sin t\sqrt{\cos 2t},\ y = \cos t\sqrt{\cos 2t}$ then find $\dfrac{dy}{dx}$. **10**

OR

If $y = (1 + x)^x$, then find $\dfrac{dy}{dx}$.

Unit-III

Q. 3. Find the equations of the tangent at the point (x, y) of the following curves : **10**

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

OR

Investigate for what value of x, $5x^6 - 18x^5 + 15x^4 - 10$ is a maximum or minimum.

Unit-IV

Q. 4. From a bag containing 5 white, 7 red and 4 black balls a man draws 3 at random, find the probability of being all white. **10**

OR

If E_1 and E_2 are two events, then prove :

$$P(E_1 \cup E_2) = P(E_1) + P(E_2) - P(E_1 \cap E_2)$$

Unit-V

Q. 5. Represent the following distribution by a

frequency polygon : **10**

Score	Frequency	Score	Frequency
90 – 99	2	50 – 59	14
80 – 89	12	40 – 49	3
70 – 79	22	30 – 39	1
60 – 69	20	20 – 29	1

OR

Find the mean deviation from the arithmetic

mean for the following frequency distribution :

Class	0 – 6	6 – 12	12 – 18	18 – 24	24 – 30
Frequency	8	10	12	9	5

I-262 **700**