

**DD-2863****B. C. A. (Part II) EXAMINATION, 2020**

Paper Second

**DIFFERENTIATION AND INTEGRATION***Time : Three Hours**Maximum Marks : 50*

**Note :** All questions are compulsory. Attempt any *two* parts from each question. All questions carry equal marks.

**Unit—I**

1. (a) If:

$$y = \sin (m \sin^{-1} x),$$

then prove that :

$$(1-x^2)y_{n+2} - (2n+1)xy_{n+1} - (n^2 - m^2)y_n = 0.$$

(b) Find 'C' of mean value theorem, if :

$$f(x) = x^3 - 5x^2 - 3x, a = 1, b = 3$$

(c) Expand  $\tan^{-1}x$  in powers of  $\left(x - \frac{\pi}{4}\right)$ .**Unit—II**

2. (a) Find the asymptotes of the curve :

$$y^3 + x^2y + 2xy^2 - y + 1 = 0.$$