*****************************SIMPSON'S $\frac{1}{3}$ RULE********************

PROBLEM NO:08   **DATE:05/04/2023**

ROLL NO:1120

STATEMENT OF THE PROBLEM:

Compute the value of the following integral correct to 5D by Simpson's $\frac{1}{3}$ Rule rule using 13 ordinates:

$$\int_{10°}^{50°} \frac{dx}{1 + (f\sin^4 x)^{\frac{1}{2}}}$$

Here, $f = \frac{(1+R)}{20}$ where R denotes last digit of your Roll Number.

WORKING RULE: **SIMPSON'S $\frac{1}{3}$ RULE**

Composite Simpson's $\frac{1}{3}$ rule for odd number of ordinates $n + 1 \geq 3$ where n is a multiple of two is:

$$I_S^C = \frac{h}{3}[(y_0 + y_n) + 4(y_1 + y_3 + y_5 + \dots + y_{n-1}) + 2(y_2 + y_4 + y_6 + \dots + y_{n-2})]$$

where h is the width of each subinterval and y_i is the ordinate at $x_i = x_0 + ih,$ (i=0,1...,n).

RESULT:

$I_S^C =$ (correct up to 5 decimal place).

SIGNATURE OF THE TEACHER