

SNS COLLEGE OF TECHNOLOGY



(An Autonomous Institution) Coimbatore – 35

DEPARTMENT OF MATHEMATICS UNIT – IV INTERPOLATION, NUMERICAL DIFFERENTIATION & INTEGRATION

NUMERICAL ENTEGRATION BY SIMPSON'S 1/3

RULE

Supposed's $y_3 RULE$: $\int_{x_0}^{x_n} y \, dn = \frac{h}{3} \left[(y_0 + y_n) + 4 \left[y_1 + y_3 + \dots + y_{n-3} \right] + 2 \left(y_{2+1} + y_4 + \dots + y_{n-2} \right) \right]$ $= \frac{h}{3} \left[A + 4B + 2C \right]$

where A = Sum of the first & last-ordinates B = Sum of the odd ordinates. C = Sum of the even ordinates.

cie) an even number of equal sub-intervals.

Dividing the lange into 10 equal parts, find the value I sim du by Simpson's 1/8 suite



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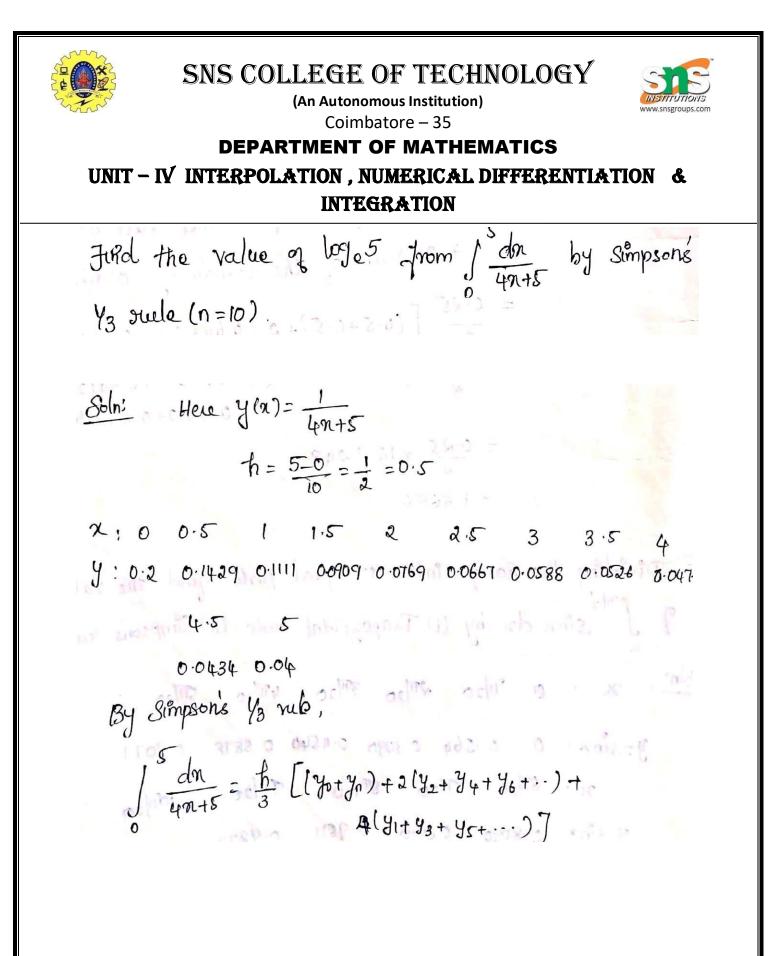


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Soln: X: O TI/20 2711/20 371/20 471/20 511/20 y=sion: 0 0.1564 0.3090 0.4540 0.5878 0.7071 2: 611/20 711/20 811/20 911/20 1011/20 4: sinx: 0.8090 0.8010 0.9511 0.9877

By Simpson's Yo suite, $\int \frac{\pi}{2} \int \int \frac{h}{2} \left[(y_0 + y_1) + 4 (y_1 + y_3 + y_5 + y_7 + y_9) + y_8 + y_8$ 2 (42+ 44+ 46+ 48+ 410)7 $= \frac{11}{20} \cdot \frac{1}{3} \left[(0+1) + 4 (3.1962) + 2 (2.6569) \right]$ = 1.0000





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$$= \frac{1}{6} \left[\frac{a}{4}, \frac{4148}{48} \right]$$

= 0.4025 - (1)
$$\int \frac{5}{4n} = \frac{\log (4n+5)}{4} \int \frac{5}{4}$$

= $\frac{1}{4} \left(\log 25 - \log 5 \right)$
= $\frac{1}{4} \log \frac{25}{5}$
= $\frac{1}{4} \log 5 - \frac{25}{5}$
= $\frac{1}{4} \log 5 - \frac{25}{5}$
= $\frac{1}{4} \log 5 - \frac{25}{5}$
= $\frac{1}{4} \log 5 = 0.4025$ loge
= $\log 5 = 1.61$