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# SNS COLLEGE OF TECHNOLOGY

(An Autonomous Institution, Affiliated to Anna University)  
Coimbatore – 641 035.



## Internal Assessment - III Academic Year 2022-2023(Even) Fourth Semester

19MAT202 – STATISTICS & NUMERICAL METHODS  
(REGULATION 2019)

(Common to Agri, Auto, FT, Mech)

A

TIME: 1 1/2 HOURS  
MARKS: 50

MAXIMUM

**ANSWER ALL QUESTIONS**  
**PART A — (5 x 2 = 10 Marks)**

- |   | CO  | BL  |   |
|---|-----|-----|---|
| 1. Write the Lagrange's interpolation formula.  | CO4 | Rem | 2 |
| 2. Given $f(0) = 1$ , $f(1) = 2$ and $f(2) = 1$ . Find the polynomial using Newton's interpolation formula. | CO4 | Und | 2 |
| 3. State Simpson's 1/3 <sup>rd</sup> rule.  | CO4 | Rem | 2 |
| 4. Using Euler's method solve $y' = 1 + y$ , $y(0) = 1$ to compute $y(0.1)$ .                               | CO5 | Und | 2 |
| 5. Write Milne's predictor-corrector formula.   | CO5 | Rem | 2 |

**PART B — (13+13+14 = 40 Marks)**

6. (a) i) The Population of a certain town is given below. Find the rate of growth of the population in 1931 and 1971. CO4 App 13

Year(x)	1931	1941	1951	1961	1971
Population in thousands(y)	40.62	60.80	79.95	103.56	132.65

(OR)

- (b) i) Evaluate  $\int_0^{\pi/2} \sin x \, dx$ , using i) Trapezoidal Rule CO4 App 13  
ii) Simpson's 1/3<sup>rd</sup> rule
7. (a) i) Using Taylor Series expansion, compute  $y(0.1)$  correct to 3 decimal places. Given  $\frac{dy}{dx} - 2y = 3e^x$ ,  $y(0) = 0$  CO5 App 6
- ii) Using modified Euler's method compute  $y(0.1)$  &  $y(0.2)$  with  $h = 0.1$  from  $y' = 1 - y$ ,  $y(0) = 0$ . CO5 App 7

(OR)

- (b) Given that  $\frac{dy}{dx} = 1 + y^2$ ,  $y(0.6) = 0.6841$ ,  $y(0.4) = 0.4228$ ,  $y(0.2) = 0.2027$ ,  $y(0) = 0$ , find  $y(-0.2)$  using Milne's method. CO5 App 13

8. (a) (i) Evaluate  $I = \int_0^6 \frac{dx}{1+x^2}$  by using CO4 Ana 14  
i) Trapezoidal Rule ii) Simpson's Rule

(OR)

- (b) Apply Runge-kutta method to find  $y(0.2)$  given  $\frac{dy}{dx} = x + y$ , CO5 App 14  
 $Y(0) = 1$ .

**Blooms Taxonomy Abbreviations: Rem-Remembrance, Und-Understanding,  
App- Apply, Ana-Analyze, Eva-Evaluate, Cre-Create**

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