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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)

B

TIME: 1 1/2 HOURS

MAXIMUM MARKS: 50

ANSWER ALL QUESTIONS

PART A — (5 x 2 = 10 Marks)

- | | CO | BL | |
|---|-----|-----|---|
| 1. Write the Lagrange's inverse interpolation formula. | CO4 | Rem | 2 |
| 2. When Newton's backward interpolation formula is used? | CO4 | Und | 2 |
| 3. State the error in Trapezoidal rule. | CO4 | Rem | 2 |
| 4. Using Euler's method find the solution of the initial value problem $y' = \log(x+y)$, $y(0) = 2$ at $x = 0.2$ by assuming $h = 0.2$. | CO5 | Und | 2 |
| 5. Write down the third order Runge-Kutta method formula. | CO5 | Rem | 2 |

PART B — (13+13+14 = 40 Marks)

6. (a) i) The population of the town is as follows: Estimate the population increase during the year 1946 and 1986. CO4 App 13

x:	1941	1951	1961	1971	1981	1991
y:	20	24	29	36	46	51

(OR)

- (b) i) Dividing the range into 10 equal parts, find the value of $\int_0^{\pi/2} \sin x \, dx$ by (i) Trapezoidal rule (ii) Simpson's rule. CO4 App 13

7. (a) i) Using Taylor Series expansion, compute $y(1.1)$ given $y' = x + y$, $y(1) = 0$ CO5 App 6

- ii) Using modified Euler's method compute $y(0.1)$ with $h = 0.1$ from $y' = y - \frac{2x}{y}$, $y(0) = 1$. CO5 App 7

(OR)

(b) Given that $y' = x - y^2$, $0 \leq x \leq 1$, $y(0) = 0$, $y(0.2) = 0.02$, $y(0.4) = 0.0795$, $y(0.6) = 0.1762$, find $y(0.8)$ and $y(1)$ by Milne's method. CO5 App 13

8. (a) (i) The population of a certain town is given below. Find the rate of growth of population in 1931 and 1971. CO4 Ana 14

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

(OR)

(b) Using Runge-Kutta method of fourth order, solve $y' = \frac{y^2 - x^2}{y^2 + x^2}$ CO5 App 14

with $y(0) = 1$ at $x = 0.2$.

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