

VELAGAPUDI RAMAKRISHNA SIDDHARTHA ENGINEERING

COLLEGE (AUTONOMOUS)

DEPARTMENT OF MATHEMATICS

QUESTION BANK - VR20

Branch: IT

SUB: CANM

CODE: 20BS3101B

1. Find by Newton's method the root of the following equations correct to three decimal places

(a) $\cos x = xe^x$ (b) $x^2 + 4\sin x = 0$ (c) $3x = \cos x + 1$

(d) $x \log_{10} x - 1.2 = 0$ (e) $\log x = \cos x$

2. Apply Lagrange's interpolation formula to find the value of y for x=10 given

x	5	6	9	11
y=f(x)	12	13	14	16

3. Apply Lagrange's formula to find the form of f(x) given

(0,-18), (1,0), (3,0), (5,248), (9,13104)

4. Find the form of f(x) using Newton's divided difference formula

x	0	2	3	6
f(x)	648	704	729	792

5. The population of a certain town is shown in the following table. Estimate the population in 1991

Year	1961	1971	1981	1991	2001
Population in thousands	19.96	39.65	58.81	77.21	94.61

6. Find the first and second derivatives at x=1.1 from the following table

x	1.0	1.2	1.4	1.6	1.8	2.0
f(x)	0	0.128	0.544	1.296	2.432	

7. Find an approximate value of $\log_e 5$ applying Simpson's rule $\int_0^5 \frac{dx}{4x+5}$ dividing the range into 10 equal parts.

8. Calculate the value of $\int_0^{\frac{\pi}{2}} \sin x \, dx$ using 11 ordinates by applying (a) Trapezoidal rule (b) Simpson's 1/3 rd rule.

9. Find an approximate value of y (a) when $x=0.2$ from $\frac{dy}{dx} = 1 - 2xy$ $y(0) = 0$

(b) When $x=1.1, 1.2$ from $\frac{dy}{dx} = \log(xy)$ $y(1) = 2$

10. Solve by Modified Euler's method $\frac{dy}{dx} = y + e^x$, $y(0) = 0$ at $x=0.2$ in steps of 0.1

11. Solve by R-K Method of fourth order for y at $x=1.2$ from $\frac{dy}{dx} = \frac{2xy + e^x}{x^2}$