

Question Bank of ANT&C

1. Find root of equation $x \log_{10} x = 1.2$ by Newton Raphson method correct to three decimal places
2. Find root of equation $x^3 - 2x - 5 = 0$ by Secant method correct to three decimal places.
3. Find root of equation $x^3 - 3x - 5 = 0$ by Muller's method.
4. Solve the following equations by Matrix Inversion method.

$$4x + 2y + 13z = 24, \quad 3x + 9y - 2z = 11, \quad 4x - 4y + 3z = -8$$

5. Apply Gauss-Jordan Method to solve the equations:

$$2x + 8y + 2z = 14, \quad x + 6y - z = 13, \quad 2x - y - 2z = 5$$

6. Solve the following equations by Gauss elimination method.

$$x + y + z = 9, \quad 2x - 3y + 4z = 13, \quad 3x + 4y + 5z = 40$$

7. If $y = 4 \cos x - 6x$, find the relative error & percentage error in y at $x=1$ given $\Delta x = 0.005$

8. find the absolute error & relative error if the number $X=0.004997$ is

- I. Truncate to three decimal digits.
- II. Round off to three decimal digits.

9. Find the cubic polynomial which takes the following values

x	0	1	2	3
$f(x)$	1	2	1	10

& evaluate $f(1.5)$.

10. Find the Lagrange's interpolation polynomial satisfying the following data

$y(1) = -3$, $y(3) = 9$, $y(4) = 30$, $y(6) = 132$. Hence find $y(1.5)$

11. Find the root of the equations $x^3 - 9x + 1 = 0$ using the Regular falsi method correct to three decimal places

12. Find the root of the equations $\cos x = 3x - 1$ using the Newton - Raphson method correct to three decimal places.

13. Find the value of $\cos 1.78$ using the values given in the table below:

X :	1.70	1.74	1.78	1.82	1.86
sinx :	.9916	.9857	.9781	.9691	.9584

18. Using Simpson's $\frac{1}{3}$ rule, evaluate the integral $\int_{1.0}^{1.8} \frac{e^{-x} + e^x}{2} dx$, $h=0.2$

19. Solve the equations by Gauss - Jordan Method

$$2x + 8y + 2z = 14, \quad x + 6y - z = 13, \quad 2x - y - 2z = 5$$

20. Solve the equations by Gauss - Seidel Method

$$2x - 3y + 20z = 25, \quad 20x + y - 2z = 17, \quad 3x + 20y - z = -18,$$

21. Determine the largest eigen values and the corresponding eigen vector of the matrix

$$A = \begin{bmatrix} 1 & 3 & -1 \\ 3 & 2 & 4 \\ -1 & 4 & 10 \end{bmatrix} \text{ by power method.}$$

22. Transform the matrix $A = \begin{bmatrix} 1 & 2 & 2 \\ 2 & 1 & 2 \\ 2 & 2 & 1 \end{bmatrix}$ to tri-diagonal form by Given's method.

23. Using Runge-Kutta method of fourth order, solve $\frac{dy}{dx} = \frac{y^2 - x^2}{y^2 + x^2}$ with $y(0)=1$ at $x=0.2, 0.4$

24. Solve $dy/dx = (x + y)$ with boundary condition $y=1$ for $x=0$ by using Euler Modified Method. Find an approximate value of y for $x=0.1$.

25. Explain round off error, truncation error, absolute error, relative error & percentage error.

26. Define interpolation & construct forward & backward difference table.

27. **Write the formula of Newton forward interpolation, Newton backward interpolation & Lagrange's interpolation formula.**

28. **What is relation between E , Δ & ∇ operator.**

29. Round off the numbers 865250, 37.46235 to four significant figures & compute relative error and percentage error in each case

30. **Explain Newton - Raphson Method.**

31. Why we use the Numerical Method?

32. Find a real root of the following nonlinear equation

1) $x^3 - 2x - 5 = 0$

2) $x^3 - 9x + 1 = 0$

Correct to three decimal places by following method

- a) Graphical Method
 - b) Bisection Method
 - c) Regula-Falsi Method
 - d) Secant Method
 - e) Newton Rapshon Method
 - f) Muller Method
33. Find a real root of the following nonlinear equation
- 1) $x \log_{10} x = 1.2$
 - 2) $\cos x = 3x - 1$
- Correct to three decimal places by following method
- a) Graphical Method
 - b) Bisection Method
 - c) Regula-Falsi Method
 - d) Secant Method
 - e) Newton Rapshon Method
 - f) Muller Method
34. Explain the Newton Rapshon Method & Muller Method.
35. Write the all Properties of Equation.
36. What is difference between of Method of False Position & Secant Method?
37. Explain the rate of convergence.
38. Write c language program of the following Method
- a) Bisection Method
 - b) Regula Falsi Method
 - c) Newton Rapshon Method