

SECTION - A (5 X 2 = 10)**Answer ALL Questions:**

1. Define – Transcendental function with example.
(OR)
2. Find a real root upto two iteration of $x = e^{-x}$ using Newton Raphson Method.
3. Write (i) Newton's forward difference interpolation formula
(ii) Newton's Backward difference interpolation formula
(OR)
4. Write (i) Stirling's formula; (ii) Bessel's formula
5. Using Newton's forward difference formula find (i) $\left(\frac{dy}{dx}\right)_{x=x_0}$; (ii) $\left(\frac{d^2y}{dx^2}\right)_{x=x_0}$.
(OR)
6. Write (i) Simpson's $\frac{1}{3}$ Rule; (ii) Simpson's $\frac{3}{8}$ rule.
7. Compare the convergence of Gauss-Jacobi and Gauss-Seidel Method.
(OR)
8. What is forward substitution?
9. Explain Picard's Method of Successive approximations.
(OR)
10. Write (i) Predictor formula, (ii) Corrector formula in Adam's Moulton Method.

SECTION - B (5 X 4 = 20)**Answer ALL Questions:**

11. Perform $2x = \cos x + 3$ correct to 3 decimal places by iteration method.
(OR)
12. Find a real root of $x^3 - 2x - 5 = 0$ by the method of false position.
13. Prove that $\mu^2 = 1 + \frac{1}{4}\delta^2$.
(OR)
14. Find the cubic polynomial for $y(0)=1$, $y(1)=0$, $y(2)=1$ and $y(3)=10$. Also obtain $y(4)$.
15. Find the first and second derivatives at $x = 2.2$

x:	1.0	1.2	1.4	1.6	1.8	2.0	2.2
y:	2.7183	3.3201	4.0552	4.9530	6.0496	7.3891	9.0250

(OR)

16. Find the area bounded by the curve and the x- axis from 7.47 to 7.52 by Trapezoidal rule for

x:	7.47	7.48	7.49	7.50	7.51	7.52
f(x):	1.93	1.95	1.98	2.01	2.03	2.06

17. Compute the inverse of $A = \begin{pmatrix} 2 & 1 & 1 \\ 3 & 2 & 3 \\ 1 & 4 & 9 \end{pmatrix}$.

(OR)

18. Solve: $2x + y + z = 10$, $3x + 2y + 3z = 18$, $x + 4y + 9z = 16$ by Gauss Elimination Method.

19. By Taylor Series, find $y(0.1)$ correct to 4 decimal places if $y(x)$ satisfies $y' = x - y^2$ and $y(0) = 1$.

(OR)

20. Determine the value of y when $x = 0.1$, given that $y(0) = 1$ and $y' = x^2 + y$ by modified Euler's Method.

SECTION -C (5 X 9 = 45)**Answer ALL Questions:**

21. Find a Positive root of $xe^x = 1$, which lies between 0 and 1 by bisection method (3 decimal places).

(OR)

22. Perform 4 iterations of the Newton Raphson Method to obtain the approximate value of $(17)^{1/4}$ starting with the initial approximation $x_0 = 2$.

23. The population of town in the decennial census was as given below. Estimate the population for the year 1895.

Year (x):	1891	1901	1911	1921	1931
Population (y) in thousands	46	66	81	93	101

(OR)

24. From the following table, find the value of $e^{1.17}$ using Gauss forward formula.

x:	1.00	1.05	1.10	1.15	1.20	1.25	1.30
e^x :	2.7183	2.8577	3.0042	3.1582	3.3201	3.4903	3.6693

25. From the following table values of x and y, Obtain $\frac{dy}{dx}$ and $\frac{d^2y}{dx^2}$ for $x = 1.2$.

x:	1.0	1.2	1.4	1.6	1.8	2.0	2.2
y:	2.7183	3.3201	4.0552	4.9530	6.0496	7.3891	9.0250

(OR)

26. Evaluate $I = \int_0^1 \frac{1}{1+x} dx$ correct to 3 decimal places by (i) Trapezoidal rule, (ii)

Simpson's rule (Take $h = 0.125$)

27. Solve $2x + 3y + z = 9$, $x + 2y + 3z = 6$, $3x + y + 2z = 8$ by the factorization method.

(OR)

28. Solve: $10x + 2y + z = 9$, $2x + 20y - 2z = -44$, $-2x + 3y + 10z = 22$ by Gauss Seidal Method.

29. Given $\frac{dy}{dx} = 1 + y^2$ where $y = 0$ when $x = 0$, find $y(0.2)$, $y(0.4)$ by IV order R- K Method.

(OR)

30. Using Milne's method, find $y(0.8)$ given that

$$\frac{dy}{dx} = x - y^2, y(0) = 0, y(0.2) = 0.02, y(0.4) = 0.0795, y(0.6) = 0.1762.$$
