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Programme	: B.Tech.	Semester	: Summer 2022-23
Course Title/ Course Code	: Applied Numerical Methods / MAT2003	Slot	: C21+C22+C23+C24+C25
Time	: 1 ½ hours	Max. Marks	: 50

Q.No.	Sub. Sec.	Question Description	Marks
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- 1 Solve the following system of equations by Gauss elimination method with the concept of partial pivoting.
- $$\begin{bmatrix} 2 & 2 & 1 \\ 4 & 2 & 3 \\ -1 & 1 & 1 \end{bmatrix} \begin{bmatrix} x_1 \\ x_2 \\ x_3 \end{bmatrix} = \begin{bmatrix} 1 \\ 2 \\ 3 \end{bmatrix}$$
- 10

- 2 Derive the rate of convergence of Gauss-Seidel method for the following system of equations
- $$\begin{aligned} -3x + y &= 2 \\ 2x - 4y + z &= 0 \\ 2y - 3z &= -1 \end{aligned}$$
- 10**

- 3 Write any two differences between direct method and iterative method. Derive the order of convergence of following iterative method.
- $x_{n+1} = \frac{x_n}{2} + \frac{a}{x_n}$ converges to $a\sqrt{2}$. 10

- 4 Approximate a positive root of equation $10 \int_0^x e^{-x^2} dt - 1 = 0$, correct up to four decimal places using secant method. **10**

- 5 Approximate the $f(1.2)$ and $f(2.8)$ using Newton divided difference interpolation.
Here f is given by the following data.

x	0	1	3	6
$f(x)$	1	4	39	250