id: 17-35626-3

Q2:

$2x + y - z = 1$

$3x + y + 2z = 8$

$4x - 3y + z = 1$

x	y	z	R.H.S	
1	−0.75	0.25	0.25	E_1
1	.33	.667	2.67	E_2
1	.5	−.5	.5	E_3
0	1.08	.417	2.42	$(E_2 - E_1)$
0	1.25	−.75	.25	$(E_3 - E_1)$

$1.08y + .417z = 2.42$ — E_4

$1.25y - .75z = .25$ — E_5

y	z	RHS	
1	-.6	.2	→ Pivoting Equation
1	.386	2.24	
0	.986	2.04	

$\therefore \quad .986z = 2.04$

$z = 2.067$

$\therefore \quad y - .6z = .2$

$\Rightarrow y - .6 \times 2.067 = .2$

$\Rightarrow y = .2 + 1.241$

$\Rightarrow y = 1.44$

putting the value y and z in E_1

$x - .75y + .25z = .25$

$\Rightarrow x - 1.08 + .517 = .25$

$\Rightarrow x = .813$

$\therefore x = .813,$

$y = 1.44$

$z = 2.067$

Mat Lab code :-

```
A = [2  1  -1;
     3  1  +2;
     4  -3  +2];
b = [1; 8; 1]

sol = A\b
```

justify

$2x+y-z = .999 \approx 1$

$3x+y+2z = 8.013 \approx 8$

$4x-3y+z = .999 \approx 1$

Q1:

$3x + 5y - 2z = 1$ — ⑤ $|3| < |5| + |-2|$

$4x - 2y + 8z = 10$ — ⑥ $|-2| < |8| + |4|$

$5x - 10y + 3z = 8$ — ⑦ $|3| < |10| + |5|$

Soln: ⑥ in the above system is not diagonally Dominated

①+③ $8x - 5y + z = 9$ $|8| > |-5| + |1|$

$5x - 10y + 3z = 8$ $|-10| > |5| + |3|$

$4x - 2y + 8z = 10$ $|8| > |4| + |-2|$

⑤ Gauss saidel interative formula.

$$x_{n+1} = \frac{1}{8}(9 + 5y_n - z_n)$$

$$y_{n+1} = -\frac{1}{10}(8 - 5x_{n+1} - 3z_n)$$

$$z_{n+1} = \frac{1}{8}(10 - 4x_{n+1} + 2y_{n+1})$$

⑨ $x_0 = 3.5, \quad y_0 = 1, \quad z_0 = .5$

n	x	y	z
0	$x_1 = 1.688$	$y_1 = .194$	$z_1 = .455$
1	$x_2 = 1.189$	$y_2 = -.069$	$z_2 = .638$
2	$x_3 = 1.002$	$y_3 = -.1080$	$z_3 = .722$
3	$x_4 = .967$	$y_4 = -.0997$	$z_4 = .7415$