

Assignment-4 (ME 542)

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Q3.a (i.e. table of Q1.a) taken Max_iteration 100.

$\varepsilon \Rightarrow$	Jacobi Method				Seidal Method			
	1e-2	1e-3	1e-5	1e-6	1e-2	1e-3	1e-5	1e-6
X_1	7.810887	7.861960	7.865865	7.865843	7.7301	7.8481	7.865678	7.8658
X_2	0.457681	0.460586	0.460848	0.460846	0.4572	0.4603	0.460841	0.4608
X_3	-0.07333	-0.07310	-0.07305	-0.07305	-0.070	-0.072	-0.07305	-0.073
X_4	-0.54896	-0.54659	-0.54618	-0.54618	-0.528	-0.543	-0.54617	-0.546
X_5	0.010666	0.010710	0.010714	0.010714	0.0106	0.0107	0.010713	0.0107
Fun_eval	1020	1650	2790	3060	300	510	960	1200
Iteration	34	54	91	100	10	16	30	37

In Jacobi method error is not converging hence value keeps increasing as the max_iteration increases.

The result in the table for gauss seidal method is given below is obtained after swapping the equation 2 and 3 as mentioned in Q1.c, without swapping the equations Seidal method also not converging.

Q3.b (i.e. table of Q1.b) taken Max_iteration 100

$\varepsilon \Rightarrow$	Jacobi Method				Seidal Method			
	1e-2	1e-3	1e-5	1e-6	1e-2	1e-3	1e-5	1e-6
X_1	1.7962e+37	1.7962e+37	1.7962e+37	1.7962e+37	1.0234	1.0029	1.0000	1.0000
X_2	1.5288e+37	1.5288e+37	1.5288e+37	1.5288e+37	2.9998	2.9999	3.0000	3.0000
X_3	2.7061e+37	2.7068e+37	2.7068e+37	2.706e+37	2.9884	2.9985	2.9999	2.9999
Fun_eval	1188	1188	1188	1188	108	156	252	300
Iteration	100	100	100	100	9	12	19	22