

Assignment-5(A):-

$$\Rightarrow \text{Iteration} = 1, \eta = 0.1, m = 1, c = -1$$

$$\frac{\delta E}{\delta m} = -\frac{1}{2} \left[(c y_{a1} - m n_1 - c)^{\dagger} n_1 + (c y_{a2} - m n_2 - c)^{\dagger} n_2 + (c y_{a3} - m n_3 - c)^{\dagger} n_3 \right]$$

$$\frac{\delta E}{\delta m} = -\frac{1}{2} \left[(1577.8 - (1)(15.17 - 1))^{\dagger} 15.1 + (1577.8 - (1)(15.17 - 1))^{\dagger} 15.1 + (1577.8 - (1)(15.17 - 1))^{\dagger} 15.1 \right]$$

$$= \frac{1}{2} [37827.8 + 37827.8 + 37827.8]$$

$$\frac{\delta E}{\delta m} = -59056.3$$

$$\frac{\delta E}{\delta c} = -\frac{1}{2} \left[(c y_{a1} - m n_1 - c)^{\dagger} + (c y_{a2} - m n_2 - c)^{\dagger} + (c y_{a3} - m n_3 - c)^{\dagger} \right]$$

$$= -\frac{1}{2} [503.2 + 503.2 + 483.2] = -745.3$$

$$\Delta m = -\eta \frac{\delta E}{\delta m} = -(0.1)(-59056.3) = 5905.631$$

$$\Delta C = -\eta \frac{\partial E}{\partial C} = -(0.1)(-44.53) = 44.53$$

$$m = 1 + 5905.631 - 5906.631 //$$

$$C = -1 + 44.53 = 43.53 //$$

\Rightarrow Iteration = 2, $\eta = 0.1$, $m = 5906.631$, $C = 43.53$.

$$\begin{aligned} \frac{\partial E}{\partial m} = & -\frac{1}{2} \left[(1577.8 - (5906.631)(45.1) - 43.53)(45.1) \right. \\ & + (1577 - (5906.631)(44.3) - 43.53)(44.3)) \\ & \left. + (1570.9 - (5906.631)(88.7) - 43.53)(88.7) \right] \end{aligned}$$

$$\frac{\partial E}{\partial m} = -\frac{1}{2} [-112273015.255] = 56136542.928$$

$$\begin{aligned} \frac{\partial E}{\partial C} = & -\frac{1}{2} \left[(1577.8 - (5906.631)(45.1) - 43.53) + \right. \\ & (1577 - (5906.631)(44.3) - 43.53) + \\ & \left. (1570.9 - (5906.631)(88.7) - 43.53) \right] \end{aligned}$$

$$\frac{\partial E}{\partial C} = -\frac{1}{2} [-1404863.731] = 702431.865$$

$$\Delta m = -(0.1)(56136542.928) = -5613654.293$$

$$\Delta C = -(0.1)(702431.865) = -70243.187$$

$$m = 5906.631 + (-5613654.293) = -5602747.662 //$$

$$C = 43.53 - 70243.187 = -70169.657 //$$