

i) Most of the updates have been given in previous part.

$\Delta\beta = \Delta\gamma = 2 \times 10^{-4}$  is used for computation of numerical gradient.

The relevant plots have been attached. For problem formulation, refer previous part. Also, please consider my extended part 1 as I'm making up the extra writing in this part. Part 1 was made elaborate to maintain continuity in explanation. Some of the details are relevant for this problem part also.

All the plots are for India. The first one shows objective vs iterations. The second one shows actual and predicted S, I, R.

We learnt the following values of  $\beta$  and  $\gamma$  after training:

$$\beta = 0.31$$

$$\gamma = 0.05.$$

$\beta$  is a parameter controlling how much the disease can be transmitted through exposure. It is determined by chance of contact and probability of disease transmission.  $\gamma$  expresses how much disease can be recovered in a specific period.



