DISCUSSION
The study of epidemic is quite interesting and important. When a small group of people having infected with an epidemic disease is inserted into a large population which is capable of catching the disease, the question arises what happens as time evolves. Will the disease die out rapidly or its spreads? How many people will catch is disease? To answer these questions, we have chosen a mathematical modelling consisting of a system of differential equations which govern the spread of infected disease within the population and analyse the behaviour of its solution. This approach will lead to the famous threshold theorem of Epidemiology which states that an epidemic will occur only if the number of people who are susceptible to the disease exceeds a certain threshold value. In this dissertation, we have discussed the spread of Gonorrheal disease among males and females in Anantapur District during the period 1995-2003, based on the recorded data available in Government Head Quarters Hospital Anantapur. As already stated, we assume in our model that an individual become infective immediately after contacting the Gonorrhea. The proportional rate $a_1, a_2,$ and $b_1$ and $b_2$ are quite difficult to evaluate. However, we have made the crude estimate of these proportional constants based on available data. It is interesting note that condition $a_1 a_2 < b_2 b_1 c_1 c_2$ is satisfied by the said constants. This condition is equivalent to

$$1 < \left( \frac{b_1 c_1}{a_2} \right) \left( \frac{b_2 c_2}{a_1} \right).$$

The expression $\left( \frac{b_1 c_1}{a_2} \right)$ can be interpreted as the average number of males that one female infective contact during her infectious period, if
every male is susceptible. Similarly the expression \( \frac{b_c c_z}{a_1} \) can be interpreted as the average number of females that one male infective contacts during his infectious period, if every female is susceptible. These quantities \( \frac{b_c c_1}{a_2} \) and \( \frac{b_c c_2}{a_1} \) are called the maximal female and male contact rates. In view of the fact that this product of maximal male and female contact rates is greater than one, we may conclude that the solution of the mathematical model approaches the equilibrium solution and the Gonorrheal disease will approach a non zero steady state in course of time. This equilibrium solution also implies that the total number of infective males and infective females will ultimately level off. And from fig (3), the point of the equilibrium approximately gives \( x_0 \) (Infective males) = 260, \( y_0 \) (Infective females) = 266. We may conclude that this Epidemic disease does not die out but ultimately approach a steady state with reference to its severity among the population of Anantapur District.