RESULT AND DISCUSSION

Frequency equation (24) is quadratic in $\lambda^2$, so it will give two roots. The natural frequency is derived for the first two modes of vibration for a square plate having varying thickness linearly in two directions, for various values of two taper constants and thermal gradient. The value of Poisson ratio has been taken as 0.345. For explanation of the problem in detail, computation has been done and the frequency of visco-elastic square plate for different values of taper constants $\beta_1$ and $\beta_2$, thermal gradient $\alpha$, at different points for first two modes of vibrations have been calculated numerically.

All calculations are carried out with the help of latest Matrix Laboratory computer software i.e. MATLAB which provides us much better results in short time as compared to other sources i.e. C++, Fortran etc.

In which we use MATLAB for calculating frequency for a visco-elastic square plate for different values of taper constants ($\beta_1$ and $\beta_2$) at different points for first two modes of vibrations is calculated.

Different cases discuss one by one are as given below:-

In Case I:-
a) It is clearly seen that value of frequency decreases as value of thermal gradient increases from 0.0 to 1.0 for $\beta_1 = \beta_2 =0.0$ for both modes of vibrations.

b) It is evident that frequency decreases continuously as thermal gradient increases, $\beta_1=\beta_2=0.2$ respectively with the two modes of vibration.

c) Here, it is again clearly seen that value of frequency decreases as value of thermal gradient increases from 0.0 to 1.0 for $\beta_1 = \beta_2 =0.4$ for both modes of vibrations.

It is interesting to note that value of frequency decreases as the combine value of $\beta_1$ and $\beta_2$ increases for different values of thermal gradient $\alpha$.

**In Case II:**

a) It is evident that frequency decreases continuously as thermal gradient increases, $\beta_1=0.2, \beta_2=0.4$ respectively with the two modes of vibration.

b) Again, it is clearly seen that value of frequency decreases as value of thermal gradient increases from 0.0 to 1.0 for $\beta_1 =0.4, \beta_2 =0.6$ for both modes of vibrations.

Now, It is interesting to seen that the value of frequency decreases as the different value of $\beta_1$ and $\beta_2$ increases for different values of thermal gradient $\alpha$.

**In Case III:**
a) In which, if we increase the value of taper constant $\beta_2$ from 0.0 to 1.0 and $\beta_1=0.2$, $\alpha=0.2$ then the value of frequency is increases.

b) It is clearly seen that if we increase the value of taper constant $\beta_2$ from 0.0 to 1.0 and $\beta_1=0.4$, $\alpha=0.6$ then the value of frequency is increases as comparing with Table I, II, III,……VII.

c) Here, it is clearly seen that if we increase the value of taper constant $\beta_2$ from 0.0 to 1.0 and $\beta_1=0.6$, $\alpha=0.8$ then the value of frequency is increases.

On Comparing above cases, we find that in Case I and Case II the value of frequency decreases as the value of $\beta_1$ and $\beta_2$ increases for different values of thermal gradient $\alpha$ and in Case III the value of frequency increases as the value of $\beta_1$ and $\alpha$ increase for different values of thermal gradient $\beta_2$. 