SCOPE AND OBJECT OF THE THESIS :

To study stellar atmosphere qualitatively and in many cases quantitatively, much attention in astrophysical problems have been given to form simple physical models. Lord Rayleigh, S. Chandrasekhar and some other astrophysicists accounted for the principal features of the brightness and polarization of the sky radiation in terms of the laws of molecular scattering. The simplest and in some ways the most important example of a physical law of light scattering which has found wide application is provided by the phase function with Rayleigh scattering . The case of small particles provides the simplest scattering behaviour, Rayleigh scattering. The particle size is to be much less than the wavelength both inside and outside of the particle . Lord Rayleigh, S. Chandrasekhar, V. V. Sobolev, J. E. Hansen and many others have discussed physically and mathematically on Rayleigh scattering. In this thesis, we mainly studied Rayleigh scattering. We calculated angular distribution of the emergent radiation and the laws of darkening for Rayleigh's phase function. We found out formulae for the formation of absorption lines and the laws of darkening for multiplet lines. The values of H-function and the diffuse reflection for Rayleigh's phase function have been calculated. All these mentioned may be useful to accelarate the study of the stellar atmosphere, idealised as plane-parallel atmosphere, for Rayleigh scattering.

To find out angular distribution of the emergent radiation, laws of darkening, diffuse reflection, the H-functions often appear inside and outside the integral sign. The H-function which is itself a solution of an integral equation, sometimes appears within an integral sign. In such cases, it is advantageous to consider a good approxi-

mate form for the H-function in a sufficienty simple form so that a single direct integration may give an appreciably good result from practical point of view. Many have considered different approximate forms for the H-function for isotropic scattering. We have shown that different approximate forms for H-function for anisotropic scattering can also be considered and the values of H-function have been shown to be a good agreement with the exact value given by S. Chandrasekhar. We have considered two approximate forms for H-function and three phase functions for anisotropic scattering. Both the approximate forms have been successfully used to construct numerical tables of H-function for the three phase functions.

In astrophysical problems, there can be a case of interlocking in Rayleigh scattering. We considered the case of interlocking in the M. - E. Model in our radiative transfer problems. We have found out general exact formulae for absorption lines and laws of darkening formed by interlocking without redistribution.