Heterocyclic compounds are of great importance because many of the biochemical materials essential to life belong to this class. Modern society is also dependent on synthetic heterocycles for use as pharmaceuticals, herbicides, pesticides as well as dyes & plastics. In these days, most of research is based on the synthesis and study of properties of heterocyclic compounds. The present study focuses on synthesis of several new nitrogen (N) and sulphur (S) containing heterocyclic compounds with the help of microwave irradiations. The microwave method for the organic synthesis is an alternative to the conventional heating methods. The results of the investigations are given in three chapters II – IV. The thesis starts with an introduction that makes the chapter I and ends with chapter V that includes biological evaluation of the synthesized compounds.

Chapter I is introductory in nature. It briefly describes the importance of heterocyclic compounds with more emphasis on nitrogen and sulphur containing heterocyclic compounds like 1,3-thiazole, pyrimidines, 3,4-dihydro pyrimidines & thiazolo pyrimidines. It also gives the general information about the microwaves and utility of microwave irradiations in organic synthesis.

Chapter II offers the synthesis of 4-(4-substituted phenyl)-1,3-thiazol-2-amine and their use in efficient synthesis of some new ethyl 7-methyl-3-(substituted phenyl)-5-(substituted phenyl)-8,8a-dihydro-5H-[1,3] thiazolo[3,2-a] pyrimidine-6-carboxylate by reaction with ethylacetooacetate and different substituted aromatic aldehydes by using microwave irradiations, followed by the detailed discussion on the characterization of the synthesized compounds using modern spectroscopic techniques like IR, NMR and Mass Spectra.

Chapter III deals with the microwave assisted synthesis of some new ethyl 3-(substituted phenyl)-5-(substituted phenyl)-7-phenyl-8,8a-dihydro-5H-[1,3] thiazolo[3,2-a] pyrimidine-6-carboxylate by cyclocondensation reaction of 4-
(4-substituted phenyl)-1,3-thiazol-2-amine (from chapter II), ethylbenzoylacetate and different substituted aromatic aldehydes under acidic conditions using microwave irradiations. It also discussed the results obtained from the spectral studies of the synthesized compounds.

Chapter IV discusses the microwave assisted synthesis of (7-methyl-3-(substituted phenyl)-5-(substituted phenyl) - 8, 8a - dihydro – 5H - [1,3] thiazolo [3,2-a] pyrimidin – 6 yl) (phenyl) methanoine by cyclocondensation reaction of 4-(4-substituted phenyl)-1,3-thiazol-2-amine (from chapter II), benzoylacetonone and different substituted aromatic aldehydes and results obtained in this chapter.

The last chapter i.e. chapter V deals with the evaluation of biological activity. Some of the synthesized compounds were screened for their antibacterial activity against three bacteria namely Staphylococcus aureus, Staphylococcus aureus (MRSA), Streptococcus pyogenes (Gram – positive) and antifungal activity against four fungi, Aspergillus niger, Neurospora crass, Cladosporium oxysporum, Candida albicans.

The structures of the products have been derived from their spectral studies (IR, $^1$H NMR, $^{13}$C NMR and Mass spectroscopy). The tables containing IR absorptions & PMR information (chemical shifts & coupling constants) of the synthesized compounds have also been given at the appropriate places.

A bibliography has been provided.

At the end, a brief summary of the work described in this thesis is appended.