Summary

The work presented in the Thesis entitled “Synthesis of Heterocyclic Compounds of Therapeutic Interest” can be summarized as below.

Chapter 1 briefly introduces importance of bicyclic and tricyclic aromatic heterocycles in drug discovery as well as concept of “privileged structures”. Chapter 1 further describes aims and objectives of the proposed research work.

In Chapter 2, synthesis of forty novel 3-cyano-2-pyridone derivatives are reported, which draw a special attention for their wide spectrum biological activities along with their importance and utility as intermediates in preparing variety of heterocyclic compounds. The synthesis was achieved by the reaction of an aromatic aldehydes, 2-cyano-N-(substituted)acetamides and malononitrile by using methanol as a solvent and piperidine as a catalyst.

Chapter 3 describes the applications of multicomponent one-pot synthesis and brief review of the reported synthetic strategies for the synthesis of pyranopyrazole derivatives. Pyranopyrazoles have been the subject of intense research due to the interesting pharmacological activities found for several of their derivatives. Chapter 3 includes synthesis of thirty novel pyrano[2,3-\(c\)]pyrazoles, which has been synthesized by one-pot three-component cyclocondensation reaction of aromatic aldehydes, malononitrile and substituted pyrazolin-5-ones in the presence of piperidine as catalyst.

Chapter 4 describes applications of microwaves in heterocyclic ring formation. Recently, 1,2,4-triazolo[1,5-\(a\)]pyrimidines have aroused increasing from the standpoint of biological activity, due to their diverse pharmacological activities. It includes synthesis of forty novel 1,2,4-triazolo[1,5-\(a\)]pyrimidines and brief review of the reported synthetic strategies. Forty 1,2,4-triazolo[1,5-\(a\)]pyrimidines were synthesized by one-pot, microwave-assisted condensation reaction of aromatic aldehyde, corresponding acetophenone and 5-amino-1,2,4-triazole using glacial acetic acid as a solvent. Thus, a new green chemistry approach was developed leading to the improvement in the reaction time, yield and simplicity of work up procedure.

All the synthesized compounds were characterized by IR, Mass, \(^1\)H NMR spectroscopy and elemental analyses.
Thus, 110 compounds are synthesized and characterized in entire thesis work. The synthesized compounds are screened for antimicrobial activity, results of which are incorporated in the thesis. Looking at the antimicrobial activity results (i.e. antibacterial and antifungal), remarkable number of compounds have demonstrated excellent antimicrobial activity as compared to the standard drugs.

All the newly synthesized compounds are also under antimycobacterial, anticancer and antiviral evaluation and their results are awaited.