The efficiency of indole derivative as chemotherapeutic agents is well established and their chemistry has been extensively studied. Literature survey revealed that indole derivatives are associated with potent biological activities and have occupied a unique place and remarkably contributed to biological and medicinal chemistry. Indole is widely distributed in natural products of plant and animal origin. The investigations pertaining to important physiological functions of serotonin, 5-hydroxytryptamine have suggested that certain mental disorders might be due to the disturbed serotonin level. In the treatment of such abnormalities, compounds possessing structural analogy with serotonin would prove to be of therapeutic value. Heterocycles like triazines, thiazolidinones, triazoles, oxadiazoles, pyrroles and triazoles have displayed versatile pharmacological properties such as antischistosomal, antibacterial, anticancer, antitubercular, antipyretic, hypoglycemic, antihypertensive, anticonvulsant, and antiinflammatory, fungicidal antibacterial activities. Pyrones are known to exhibit wide number of biological properties like anticancer, antiallergic, antiinflammatory, muscle relaxant, antifungal and antiviral activity. 1,2,3-Triazoles and their derivatives have found diverse uses in synthetic, analytical, medicinal, pharmaceutical, agrochemical, photographic chemistry and in other applications as corrosion inhibitors, dye stuffs, fluorescent whiteners, asymmetric dihydroxylation catalysts and photosensitizers.

In the light of significant and broad spectrum activities and also in continuation of our work on indole derivatives, we report in this thesis the synthesis of pyranoindoles, bis/trisheterocycles and 1,2,3-triazolylindole derivatives involving indole moiety.

Our present investigation is centered around the studies of chemoselective reactions, 1,3-dipor cycloaddition reactions, synthesis, spectral analysis, antimicrobial activities of indole based bis/trisheterocycles.
pyranoindole and 1,2,3-triazolylindole derivatives. The work carried out during present investigation is discussed in separate chapters which encompasses relevant literature background, present work, results obtained in terms of their chemical and spectral properties and details of experimental procedures.

The first chapter (Introduction) mainly deals with the reported biological properties of various significant indole derivatives. The purpose of choosing the above compounds is justified.

The second chapter involves the synthesis of α-pyran and γ-pyrones fused to the benzenoid part of the indole moiety.

The third chapter is aimed at synthesising bisheterocycles such as triazine, tetrazole, oxadiazole, pyrrole, triazole derivatives linked at the position-5 of the indole ring and also thiazolidinone, pyrrole and triazole derivatives linked at the position-1 of the indole moiety.

This chapter is also aimed at synthesising oxadiazole, pyrrole and triazole linked at position–1 and –5 of indole ring leading to the trisheterocycles.

The fourth chapter involves 1,3-dipolar cycloaddition reactions of indole/benzindole azides with various dipolarophiles leading to the synthesis of 1,2,3-triazolylindoles / benz(g)indoles. It also aimed at synthesis of bispyrroles, bisoxadiazoles linked at position–4 and –5 of 1,2,3-triazolylindole / benz(g)indole.

Fifth chapter covers the synthesis of phenylthioethylindoles/ benz(g) indoles and also phenoxyethylindoles/ benz(g) indole derivatives (Scheme-14) and also the cleavage of N-CH₂ bond of indole/benz(g)indole mesylates by NaCN.
The sixth chapter deals exclusively with antimicrobial (antibacterial / antifungal) screening results of various newly synthesised compounds. The growth inhibitory activities of these compounds against Gram positive and Gram negative bacterial strains and fungal strains have been studied.

All the new compounds synthesised during the present investigation have been characterised by their spectral and analytical data.