Aims and Objectives

- Liquid crystalline materials are in good in demand in these a days. Mesogenic materials have become relevant to the needs of the society due to their versatile applications. The field of liquid crystals has fascinated chemists, physicists as well as technologists, over several decades by now; their applications in numerous fields of modern technology like, electro optical display devices, medical thermography, high strength fiber, liquid crystal in gas liquid chromatography etc., devices have developed further interest in search for new mesogens and exploration of fundamental causes of the captivating phenomenon. The synthesis and study of liquid crystalline materials has been continually contributing to the advancement in science and technology. Synthesizing and studying new mesomorphic compounds can yield interesting and useful information and results.

- Thus, the prime and foremost aim set forth for this investigation is to synthesize new homologous series of high mesomorphic value by varying certain categorical units of the moieties; with specific considerations, certain structural features have been altered Whilst some have been mentioned as common to newly synthesized homologous series. To synthesize homologous series having ester and azo central linkages with different lateral substitutions, lateral substitution at different positions as well as different terminal substitutions.

- To synthesize homologous series having lateral substitution at terminal benzene ring, ethylideneamino and different ester central linkages.

- Potential applications of the bent – shaped mesogens in non – linear optics, optical storage and electro optical devices has developed considerable interest in the synthesis and structural investigations of these bent – shaped mesogens. Substitution at 2 and 5 positions in 1, 3, 4 – thiadiazole core makes molecule bent. Thus in view of this synthesis of mesogens having 1, 3, 4 – thiadiazole core as central bent core and banana shaped mesogens with five benzene rings have been planned and their mesomorphic properties are studied.

- Study of mixed mesomorphism in binary systems by varying in structural features and mesomorphic characteristics of components have been considered of interest; it has helped revealing some characteristics of liquid crystals. Study of binary systems is important as it depresses the transition temperatures, with changes in mesophase textures. Thus some binary systems comprising structurally dissimilar components and chiral dopant as one of the

component in binary systems have been prepared and their mixed mesomorphism has been studied.

- Lastly, but not the least the purpose of this investigation is to arrive at certain specific conclusions to the existing knowledge in the subject matter as viewed from the background of the study of large number of newly synthesized liquid crystalline materials under this investigation, their mesomorphic characteristics and also the study of mixed mesomorphism in binary systems.