Abstract

The present thesis deals with some problems associated with analytic functions in the geometric function theory. We determine the coefficient estimates for inverse of functions in several classes of analytic as well as meromorphic functions. In this direction, one such important technique is to find the coefficient estimates of negative powers of normalized univalent functions.

Next, we investigate some families of m-fold symmetric analytic functions defined in terms of subordination which generalize the Janowski starlike functions. In particular, we determine estimates for Dirichlet integral as well as for certain integral means of functions in these classes.

Further, we consider the Hornich space H consisting of all normalized locally univalent and analytic functions f on the unit disk $\mathbb{D}$ for which $\arg f'$ is bounded in $\mathbb{D}$. We determine the set of extreme points for several subclasses of H with respect to the Hornich space structure. Using these extreme points, we develop a new approach to obtain the pre-Schwarzian norm estimate for functions in these subclasses of H. We also consider a two parameter integral operator and determine all the values of the parameters for which the operator maps a specified subclass of H into another specified subclass of H. Further, we consider a larger space $\widetilde{H}$ whose linear structure is same as that of H and study the same problems as stated above for certain subclasses of $\widetilde{H}$.

Finally, we determine an estimate of the third logarithmic coefficient for close-to-convex functions with argument 0. In this context, we consider the class of close-to-convex functions with respect to Koebe function (with argument 0) and the class of close-to-convex functions with respect to odd starlike functions (with argument 0) and determine the sharp upper bound of the first three logarithmic coefficients for such functions.

Keywords: Analytic, meromorphic, univalent, starlike, convex, close-to-convex, spirallike functions; hypergeometric functions; subordination; coefficient bounds; maximum area problem; Hornich space; extreme point; pre-Schwarzian norm; logarithmic coefficient.