The purpose of this thesis is studying some interesting properties of subclasses in the theory of univalent and multivalent functions. It is the study of differential subordination of multivalently analytic functions associated with the generalized Srivastava-Attiya operator involving a convolution structure. One obtains some certain properties of multivalent functions involving a generalized Srivastava-Attiya operator by using differential subordination, like, let \( f \in \mathcal{R}(p) \) and \( Q(z) \) can be defined by (2.12). If

\[
\left( \frac{J_{p,s,b}(f * g)(z)}{z^{p-1}} \right)' < \frac{1 + (1 - 2\eta)z}{1 - z}, (z \in U),
\]

then

\[
\frac{Q'(z)}{z^{p-1}} < \left( 1 - \eta + \eta(3(b + 1) - 2p) \right) \frac{1 + (1 - 2\eta)z}{1 - z}, \quad (|z| < p),
\]

where \( 0 \leq \eta < 1 \), and

\[
p = \left[ 1 + \frac{\eta}{1 - \eta + \eta(3(b + 1) - 2p)} \right]^{\frac{1}{2}} - \frac{\eta}{1 - \eta + \eta(3(b + 1) - 2p)}.
\]

The bound \( p \in (0,1) \) is the best possible. We have also studied certain differential subordination results by using a new operator of meromorphic univalent functions. We define a new operator (Hadamard product of generalized Cho-Kwon-Srivastava operator and Jung-Kim-Srivastava integral operator) denoted by \( Q^{\mu,k,\lambda}_{\alpha,\beta,\eta,\theta} \) given by \( Q^{\mu,k,\lambda}_{\alpha,\beta,\eta,\theta} : \mathcal{R}_1^* \to \mathcal{R}_1^* \).

\[
Q^{\mu,k,\lambda}_{\alpha,\beta,\eta,\theta} f(z) = (Q^{\lambda}_{\eta,\theta} * I^{\mu,k}_{\alpha,\beta,\lambda}) f(z).
\]

Some differential subordination results one obtained, If \( g \) be a convex function such that \( g(0) = 1 \) and let \( h \) be the function \( h(z) = g(z) + zg'(z) \), for \( z \in U \). If \( \lambda \geq 0, n \in N, f \in \mathcal{R}_1^* \) and the differential subordination

\[
z^2 \left( Q^{\mu,k,\lambda}_{\alpha,\beta,\eta,\theta} f(z) \right)' + 2z \left( Q^{\mu,k,\lambda}_{\alpha,\beta,\eta,\theta} f(z) \right) < h(z), \quad \text{for} \quad z \in U,
\]
then
\[ z \left( Q!^{u,k,\lambda}_{\alpha,\beta,\eta,\theta} f(z) \right) < g(z), \quad \text{for } z \in U, \]
and this result is sharp. Also, we have given differential sandwich theorems for some subclasses of meromorphic p-valent analytic functions associated with a linear operator. We obtain subordination and superordination results for subclass of meromorphic p-valent analytic functions in the punctured unit disk \( U^* \), like, let \( q(z) \) be a convex univalent in \( U \), and \( \delta, \gamma \in \mathbb{C} \). Suppose that \( q(z) \) satisfies
\[
Re \left( 1 + \frac{zq''(z)}{q'(z)} - \frac{zq'(z)}{q(z)} \right) > 0.
\]
If \( f(z) \in \mathcal{R}_p^* \) satisfies the subordination
\[
\Phi(f, \alpha, \eta, \mu, \beta, \delta; p) < 1 + \gamma \frac{zq'(z)}{q(z)},
\]
where
\[
\Phi(f, \alpha, \eta, \mu, \beta, \delta; p) = 1 + \gamma \delta \left( \frac{\alpha + \eta}{\alpha + 1} \left( \frac{(H^{p,\eta,\mu}_{p,\eta,\mu} f(z))'}{(H^{p,\eta,\mu}_{p,\eta,\mu} f(z))'} - 1 \right) \right),
\]
then
\[
\left( \frac{z^{p+1}(H^{\alpha}_{p,\eta,\mu} f(z))'}{p} \right)^{\delta} < q(z) \text{ and } q(z) \text{ is best dominant.}
\]
We have discussed and studied the subclass \( \mathcal{R}_\delta(\beta, \alpha, \gamma) \) of spiral-like functions defied by applying fractional calculus. We obtain some interesting properties, like, coefficient inequality, distortion theorems for the fractional derivative and fractional integral, extreme points, radii of starlikeness, convexity, close-to-convexity, closure theorems and partial sums. Also, we study a subclass of univalent functions \( \mathcal{R}_w^\lambda(B, \theta, V, T) \) with fixed point by using Hilbert space. We obtain some geometric properties, like, coefficient bounds, distortion bounds, extreme points and partial sums. Also we obtain properties for our class and the effect of an operator on functions in it. We have also dealt with the certain subclass of meromorphically multivalent functions \( f^{\alpha,\beta}_p(\theta, \delta, \nu) \) defined by convolution and integral operator involving I- function. We obtain some results,
Abstract

like, Coefficient inequality, Modified Hadamard Product, Integral means and Inclusion properties are obtained for the class $J_{p}^{\alpha,\beta}(\theta, \delta, \nu)$.

We have introduced and studied a new subclass of Harmonic meromorphic functions of the form $f = h + \overline{g}$, where

$$
h(z) = z + \sum_{n=2}^{\infty} a_n z^{-n}, \quad g(z) = \sum_{n=1}^{\infty} b_n z^{-n}, \quad |b_1| < 1,
$$

and satisfying the condition:

$$
Re \left\{ \nu + \frac{a}{b} \left[ \frac{(1 + \mu)(zf'(z) + \lambda z^2 f''(z)) - \mu}{(1 - \lambda)f(z) + \lambda f'(z)} - \nu \right] \right\} \geq \gamma,
$$

We obtain sufficient coefficient condition for harmonic meromorphic univalent functions $f = h + \overline{g}$ to be in the class $WR_{H}(a, b; \lambda, \gamma, \nu, \mu)$. We also show that this coefficient condition is also necessary for $f \in WR_{\overline{H}}(a, b; \lambda, \gamma, \nu, \mu)$. Another properties, like, distortion bounds, extreme points, convolution condition and convex combination for the functions in the class $WR_{\overline{H}}(a, b; \lambda, \gamma, \nu, \mu)$ are obtained.