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ON MULTIVALENT FUNCTIONS WITH NEGATIVE AND MISSING COEFFICIENTS

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1. Introduction

Let $S(p)$ be the class of functions $f(z)=z^p-\sum_{n=k}^{\infty} a_{n+p} z^{n+p}$ which are analytic in the unit disc $D=\{z:|z|<1\}$. For $0\leqslant\alpha\leqslant 1$, $0\leqslant\beta<1$ and $0<\gamma\leqslant 1$, let $P_k(\alpha,\beta,\gamma)$ be the class of those functions $f(z)$ of $S(p)$ which satisfy the condition

$$\left|\frac{z\frac{f'(z)}{f(z)}-p}{\alpha z\frac{f'(z)}{f(z)}+[1-(1+\alpha)\beta]p}\right|<\gamma \tag{1.1}$$

for $z\in D$. Let T_p denote the subclass of $S(p)$ consisting of P-valent functions in D and having Taylor expansion of the form

$$f(z)=z^p-\sum_{n=k}^{\infty} a_{n+p} z^{n+p} \qquad (a_{n+p}\geqslant 0,\ k\geqslant 2)\ . \tag{1.2}$$

Let $P_k[\alpha,\beta,\gamma]=P_k(\alpha,\beta,\gamma)\cap T_p$.

Goel and Sohi [1], Sarangi and Uralagaddi [2], Shukla and Dashrath [3] and Silverman [4] have studied certain subclasses of analytic functions with negative coefficients. Kumar [5], Sarangi and Patil [6] have studied the class of univalent functions with negative and missing coefficients. In this paper, we obtain integral representation formula, coefficient estimate, distortion theorem, covering theorem and radius of convexity for $P_k[\alpha,\beta,\gamma]$.

We also obtain the class preserving integral operators of the form

$$F(z)=\frac{p+c}{z^c}\int_0^z t^{c-1} f(t)dt, \qquad c>-p \tag{1.3}$$