

**A NEW SUBCLASS OF MULTIVALENT HARMONIC FUNCTIONS  
DEFINED BY USING NOVEL INTEGRAL OPERATOR**

**Jitendra Awasthi**

Department of Mathematics,  
S. J. N. M. P.G. College,  
Lucknow - 226001, Uttar Pradesh, INDIA  
E-mail : drjitendraawasthi@gmail.com

**(Received: Mar. 01, 2025 Accepted: May 24, 2025 Published: Jun. 30, 2025)**

**Abstract:** In this paper a subclass of  $p$ -valent (or multivalent) harmonic functions defined by using Novel Integral Operator in the open unit disc has been introduced and some properties as coefficients estimate, extreme points, distortion bounds, closure theorems convex and closure properties have been studied.

**Keywords and Phrases:** Open Unit disk, Multivalent Functions, Harmonic Functions, Convolution, Novel Integral Operator, Convex set.

**2020 Mathematics Subject Classification:** Primary 46J05, Secondary 46J10.

**1. Introduction**

$$f(z) = z^p + \sum_{k=1}^{\infty} c_{k+p} z^{k+p} (p \in \mathbb{N}) \quad (1.1)$$

which are analytic in the open unit disk  $D = \{z \in \mathbb{C} : |z| < 1\}$ . A continuous function  $F = H + iG$  is a complex valued harmonic function in a complex domain  $C$ , if both  $U$  and  $V$  are real harmonic in  $C$ . In any simply connected domain  $D \subseteq C$ , we can write  $F = H + \bar{G}$ . We call  $H$  the analytic part and  $G$  the co-analytic part of  $F$ . A necessary and sufficient condition for  $F$  to be locally univalent and sense-preserving in  $D$  is that  $|H'(z)| > |G'(z)|$  in  $D$  (see Clunie and Sheil-Small [6]).