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TWO VARIABLE MODIFIED LAGUERRE POLYNOMIALS AND THEIR GENERATING RELATIONS

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Abstract: In this paper, the notion of two variable modified Laguerre polynomials (TVMLP) $L_{\alpha,\beta,m,n}(x,y)$ is given and their generating relations are derived. The process involves the problem of framing TVMLP into the context of the representation $\uparrow\omega,\mu$ of a Lie algebra $G(0,1)$. Certain new and known generating relations for the polynomials related to TVMLP are also obtained as special cases.

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Key Words: Two variable Laguerre polynomials, Lie algebra, generating relations.

1. Introduction:

In recent years, a great deal of attention seems to have been paid to a slight variant of the associated Laguerre polynomials (ALP)$L_n^{(p)}(x)$. These so–called modified Laguerre polynomials (MLP)$L_{\alpha,\beta,m,n}(x)$ were introduced by Goyal [4] in the form

$$L_{\alpha,\beta,m,n}(x) = \frac{\beta^n (m)_n}{n!}\ {}_1F_1\left[-n;m;\frac{\alpha x}{\beta}\right], \quad (\beta\neq 0; m\neq 0,-1,-2\ldots). \tag{1.1}$$

We note that