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NEW TYPE OF DEGENERATE CHANGHEE POLYNOMIALS OF THE SECOND KIND

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Abstract: In this paper, we consider the new type of degenerate Changhee numbers and polynomials of the second kind which are different from the previously introduced degenerate Changhee numbers and polynomials of the second kind by Kim-Kim. We investigate some properties of these numbers and polynomials. In addition, we give some new relations between the new type of degenerate Changhee polynomials of the second kind and the Carlitz's degenerate Euler polynomials.

Keywords and Phrases: Degenerate Changhee polynomials and numbers of the second, new type degenerate Changhee polynomials of the second kind, Stirling numbers.

2020 Mathematics Subject Classification: 11B83, 11B73, 11S80.

1. Introduction

Let p be a fixed odd prime number. Throughout this paper, $\mathbb{Z}_p$, $\mathbb{Q}_p$ and $\mathbb{C}_p$ will denote the ring of p-adic integers, the filed of p-adic rational numbers and the completion of an algebraic closure of $\mathbb{Q}_p$. The p-adic norm $|\ .\ |_p$ is normalized by $|\ p\ |_p = \frac{1}{p}$. Let $C(\mathbb{Z}_p)$ be the space of continuous function on $\mathbb{Z}_p$. For $f \in C(\mathbb{Z}_p)$, the fermionic p-adic integral on $\mathbb{Z}_p$ is defined by Kim as follows

$$I(f) = \int_{\mathbb{Z}_p} f(x) d\mu_{-1}(x) = \lim_{N\to\infty} \sum_{x=0}^{p^N-1} f(x)\mu_{-1}(x + p^N\mathbb{Z}_p)$$