

ON RECENT PARTITION FUNCTION OF KAUR AND RANA

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Abstract: Recently, Kaur and Rana introduced the partition function denoted by $\rho(n)$, where the largest part λ appears exactly once, and the remaining parts constitute a partition of λ . In this paper, we establish new generating functions for certain variants of $\rho(n)$. Further, we obtain a linear recurrence relation for our new generating function.

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1. Introduction

Throughout this paper, we adopt the standard notations on partitions and q -series, as in Andrews [3] and Gasper and Rahman [7] respectively. The q -shifted factorial $(a; q)_n$ is defined by

$$(a; q)_n = \begin{cases} 1 & , \text{ for } n = 0 \\ \prod_{k=0}^{n-1} (1 - aq^k) & , \text{ for } n \geq 1, \end{cases}$$

where $(a; q)_\infty = \lim_{n \rightarrow \infty} (a; q)_n = \prod_{k=0}^{\infty} (1 - aq^k)$.

Since the infinite product diverges when $a \neq 0$ and $|q| \geq 1$, whenever $(a; q)_\infty$ appears in an identity, we shall assume $|q| < 1$.