

Accepted Manuscript

Some new congruences for Andrews' singular overpartitions

T. Kathiravan, S.N. Fathima

PII: S0022-314X(16)30260-8
DOI: <http://dx.doi.org/10.1016/j.jnt.2016.09.026>
Reference: YJNTH 5592

To appear in: *Journal of Number Theory*

Received date: 11 September 2016
Revised date: 20 September 2016
Accepted date: 21 September 2016

Please cite this article in press as: T. Kathiravan, S.N. Fathima, Some new congruences for Andrews' singular overpartitions, *J. Number Theory* (2017), <http://dx.doi.org/10.1016/j.jnt.2016.09.026>

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.



Some New Congruences for Andrews' Singular Overpartitions

¹T. Kathiravan and ²S. N. Fathima

Department of Mathematics,
Ramanujan School of Mathematics,
Pondicherry University,
Puducherry - 605 014, India.

Abstract:

Recently, Andrews defined combinatorial objects which he called singular overpartitions and proved that these singular overpartitions which depend on two parameters k and i can be enumerated by the function $\overline{C}_{k,i}(n)$, which denotes the number of overpartitions of n in which no part is divisible by k and only parts $\equiv \pm i \pmod{k}$ may be overlined. G. E. Andrews, S. C. Chen, M. Hirschhorn, J. A. Sellars, Olivia X. M. Yao, M. S. Mahadeva Naika, D. S. Gireesh, Zakir Ahmed and N. D. Baruah noted numerous congruences modulo 2, 3, 4, 6, 12, 16, 18, 32 and 64 for $\overline{C}_{3,1}(n)$. In this paper, we prove congruences modulo 128 for $\overline{C}_{3,1}(n)$, and congruences modulo 2 for $\overline{C}_{12,3}(n)$, $\overline{C}_{44,11}(n)$, $\overline{C}_{75,15}(n)$, and $\overline{C}_{92,23}(n)$. We also prove “Mahadeva Naika and Gireesh’s conjecture”, for $n \geq 0$, $\overline{C}_{3,1}(12n + 11) \equiv 0 \pmod{144}$ is true.

2010 Mathematics Subject Classification: 11P83, 05A17.

Keywords: Singular overpartition, Theta function, Congruence, Dissection.

1 INTRODUCTION

A partition of a positive integer n denoted by $p(n)$, is a nonincreasing sequence of positive integers whose sum is n . If ℓ is a positive integer, then a partition is called a ℓ -regular partition denoted by $b_\ell(n)$, if there is no part divisible by ℓ .

The generating function for $b_\ell(n)$, is given by

$$\sum_{n=0}^{\infty} b_\ell(n)q^n = \frac{(q^\ell; q^\ell)_\infty}{(q; q)_\infty} = \frac{f_\ell}{f_1}, \quad (1.1)$$

¹Email: kkathiravan98@gmail.com

The first author research is supported by UGC-BSR, Research Fellowship, New Delhi, Government of India.

²Corresponding author.

Email: fathima.mat@pondiuni.edu.in

Download English Version:

<https://daneshyari.com/en/article/8897195>

Download Persian Version:

<https://daneshyari.com/article/8897195>

[Daneshyari.com](https://daneshyari.com)