

SOME COMBINATORIAL PROPERTIES OF n -COLOUR COMPOSITIONS

Geetika Narang¹ and A.K. Agarwal²

Centre for Advanced Studies in Mathematics
Panjab University, Chandigarh-160 014, India

E-mail: geetika2narang@yahoo.com; aka@pu.ac.in

(Received: January 08, 2008)

Dedicated to Prof. George E. Andrews on his 70th Birthday

Abstract: A connection between a special kind of walks in the XY -plane studied by J.H. van Lint and R.M. Wilson [7] and n -colour compositions introduced recently by A.K. Agarwal [1] is shown. This leads to several new combinatorial properties of the walks and also gives a new binomial identity with its combinatorial interpretation.

Keywords and Phrases: Walks, Fibonacci numbers, n -colour compositions, self-conjugate partitions, odd-even partitions, generating function, recurrence formula, binomial identity, combinatorial properties

2000 AMS Subject Classification: 05A15, 05A17, 11P81

1. Introduction

A partition of a positive integer n is a finite non-increasing sequence of positive integers whose sum is n . The Ferrers graph of a partition t_1, \dots, t_i of n is a set of i rows of equi-spaced dots aligned on the left where the j^{th} row has t_j dots. For example, the Ferrers graph of the partition $4+4+3+2+1$ of 14 is

```

. . . .
. . . .
. . .
. .
.

```

If the graph is read vertically by columns then this represents the partition $5+4+3+2$ of 14. This new partition is called the conjugate of the given partition.

¹Supported by CSIR Award No.F.No.9/135(468)/2k3-EMR-I

²Supported by CSIR Research Grant No.25(0158)/07/EMR-II