Abstract

It is hard to imagine life without polymer because of their several uses. The term polymer is derived from a Greek word poly means 'many', and meros meaning 'parts'. Hereby, polymer is a large unit made up of small structural units, called monomer connected by a covalent bond [1]. They can have identical monomers (homopolymer) or it can be all di#erent (heteropolymer). Polymer can be both found in nature or be produced articially. Some of the well known polymers are natural rubber, cellulose etc., where as plastic, nylon, to name a few, are synthetic polymers produced chemically by a process called polymerization [1]. Structurally, polymers can be linear, branched or has a network like structure. In a linear polymer the monomers are arranged in a linear fashion. For a branched polymer, there are side chains coming out as branches giving it a tree-like structure. However, by a polymer we shall mean a linear polymer. During the past several decades, geometrical lattice models such as random walks etc., have played an important role in statistical mechanics such as study of polymer adsorption. Lattice models, in spite of their apparent simplicity, can be successfully used in the studies of real physical systems, to describe conformation and growth features. We focus on simple mostly two-dimensional lattice Models. In order to make our models exactly solvable, we impose "microscopic" restrictions by disallowing certain steps in an unrestricted random walk. The resulting models are in many instances exactly solvable by methods including generating function.The idea is to solve exact solutions for Dyck and Motzkin paths.