ASYMPTOTIC RESULTS FOR THE FIRST AND SECOND MOMENTS OF DISCRETE-TIME BULK-RENEWAL PROCESS

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A simple and elegant solution to determine the asymptotic results for the renewal density as well as for the first and second moments of the number of renewals for the discrete-time bulk-renewal process is presented. The method of generating function is used to find the constant term in the second moment. In classic texts such as Feller (1968) and Hunter (1983), the constant term is missing. A recent paper by Van der Weide et al. (2007) states that it is not clear how to get the constant term using generating functions and as such they present this result using a different approach. Recently, Chaudhry and Fisher (2011) have responded to this problem by providing the asymptotic results for the renewal density as well as for both the first and second moments using generating functions. The purpose of this note is to extend their results to bulk-renewal process in discrete-time and give an elegant derivation of the asymptotic results.