ABSTRACT

Master's Thesis

TAUBERIAN THEOREMS FOR REGULARLY GENERATED SEQUENCES

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One of the main objectives of the classical Tauberian theory is to recover convergence of sequences, whose divergence is manageable, out of the existence of certain limits which is known as Abel's necessary condition or its generalizations, and certain additional conditions that control the oscillatory behavior. These conditions are called Tauberian conditions and this type of theorems are called Tauberian theorems. In terms of the control modulo of oscillatory behavior of integer order, introduced by Stanojević, we now summarize the classical results. Tauber proved that if the classical control modulo of a sequence is a null sequence, then one obtains convergence of sequence out of its Abel's necessary condition. Littlewood showed that Tauber's condition can be replaced by the boundedness of the classical control modulo of a sequence. Later Schmidt introduced the slowly oscillating sequences and proved the more general theorem, which is known as the generalized Littlewood theorem. Using Karamata's Hauptsatz and employing the concept of regularly generated sequences introduced by Stanojević, Dik obtained new Tauberian theorems and generalized classical Tauberian theorems for Abel limitable method. Dik ve Çanak proved classical and nonclassical Tauberian theorems for Abel limitable method by the concept of regularly generated sequences. Çanak ve Dik investigated under which conditions sequences converges or converges subsquentially, provided that its generator sequence or sequence of its backword differences is slowly oscillating.

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Key Words:
Tauberian theorems, slowly oscillating sequences, Abel limitable method, subsequentially convergent sequences, moderately oscillating sequences, regularly generated sequences.