Although integral transforms like Laplace Transform, Fourier Transform, Mellin Transform are being intensively used both in Mathematics and Mathematical Physics, that there is a link between these transforms and suitable boundary value problems has been first focussed by Professor E.C. Titchmarsh in the sixth chapter of his book 'Eigenfunction expansion associated with second order differential equation Vol.I'.

However, in the case of well-known transforms such as Laplace Transform, Fourier Transform etc. the transform of a suitable function $f$ of $L^2(0,\infty)$ (the space of functions $f$ such that $\int_0^{\infty} |f(x)|^2 dx < \infty$) is again a member of the same space, but this is not so in the case of the general transform as defined by Titchmarsh. In order to carry on the analysis as done by Titchmarsh it is essential to have some knowledge about the structure of the space of all transforms, referred to, in short, as the Transformed space. The object of the present thesis is to prove that the transformed space is a Hilbert space and to establish a link between the convergence of the
expansion of an arbitrary function $f \in L^2(0,\infty)$
associated with a (second-order) boundary value
problem with the convergence of a special sequence
in the Transformed space. Obviously the next job
is to extend the idea to higher order differential
equations which is the subject matter of the last
three chapters of the thesis.