

## STEADY-STATE THERMOELASTIC PROBLEM OF A FINITE LENGTH HOLLOW CYLINDER

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### Abstract

This paper deals with the determination of steady state thermoelasticity in finite length of hollow cylinder with the temperature maintained at zero on the upper surface of the plate and a third kind boundary condition maintained at arbitrary constant  $f(r)$  on the lower surface of the plate. Here, in this paper, an attempt is being made to find the solution of the steady state thermoelasticity in finite length of hollow cylinder with its outer edges subjected to the third kind boundary condition as zero. In order to obtain the solution of the governing equation, which is a partial differential equation, the following procedures of analysis have been adopted.

1. Normalizing of the governing partial differential equation subject to appropriate initial, boundary and interior condition.
2. Taking finite Hankel transform of the resulting equation with respect to variable  $r$ .
3. Achieving the inverse finite Hankel transform.

The expression of temperature distribution, thermoelastic displacement and stress functions are obtained in terms of Bessel's function and the results are illustrated numerically and graphically.

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**Keywords:** Temperature distribution, Thermoelastic problem, thermoelastic displacement, Thermal Stresses.