55. A grinding wheel has a diameter of $d_o = 200$ mm, and a bore with a diameter of $d_i = 20$ mm. The weight of the wheel is $m \sim N(1,\ 0.1^2)$ kg and the thickness is $t = 5$ mm. The Poisson's ration is $\nu = 0.20$. If the allowable tangential stress is $S_a \sim N(3,\ 0.3^2)$ MPa and the maximum probability of failure is designed to be $p_f = 10^{-5}$, determine the maximum working speed of the grinding wheel using the theory of rotating rings.

Answer: $n_{\max} = 1917$ rpm