12 Nm Torque

$(F_t)(r) = (F_t)(0.1) = 12$

$F_t = 120N$

friction $F_t = (\text{coeff})(F_n)$

$120 = 0.6\ F_n$

$F_n = 200N$

Loading on Shaft

(1) Torque 12 Nm CONSTANT

(2) Axial load 200N constant

(3) Bending Moment occurs in two planes.

$$\sqrt{\left[\underset{200}{(F_n)}(0.1)\right]^2 + \left[\underset{120}{(F_t)}(0.05)\right]^2}$$

$= 20.88\ Nm$

need Stress concentration factors.

look up K_t 3 times and q also

Torsion	Axial	Bending
$K_t = 1.10$	$K_t = 1.28$	$K_t = 1.28$
$q = 0.93$	$q = 0.91$	$q = 0.91$
K_f 1.09	1.25	1.25

Remember $K_f = 1 + q(K_t - 1)$