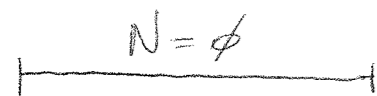
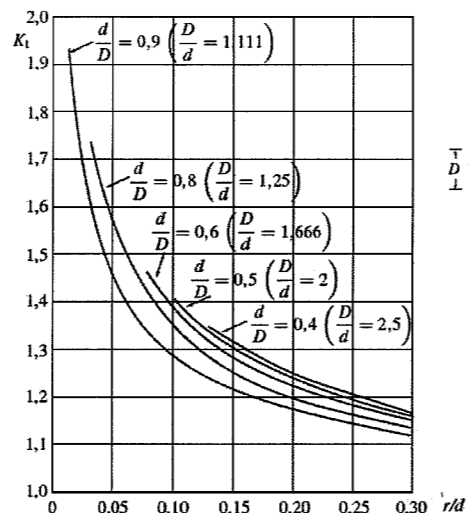
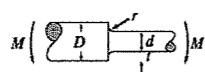
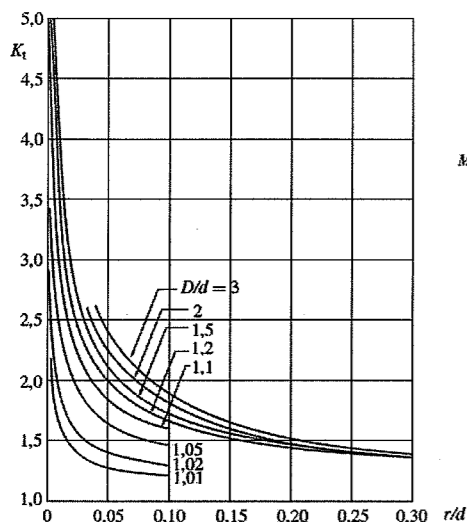


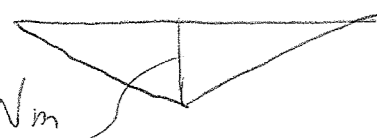
Si richiede di tracciare i diagrammi delle azioni interne nell'albero, e di verificare la/e sezione/i più sollecitata/e con gli opportuni criteri di verifica, utilizzando i diagrammi sottostanti per la determinazione di K_t ed ipotizzando i valori di eventuali ulteriori parametri (giustificandone la scelta).

Dati:

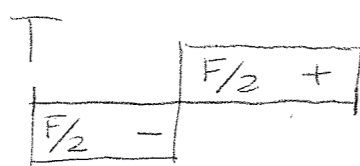
$F = 20000 \text{ N}$
 $r = \text{raggio della puleggia} = 300 \text{ mm}$
 Materiale dell'albero: 39NiCrMo3, $R_m = 900 \text{ MPa}$ $R_s = 685 \text{ MPa}$



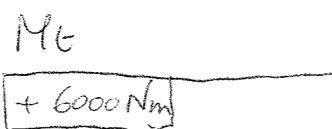
M_R



2500 Nm



$F/2 = 10000 \text{ N}$



SEZ. H-H VERIFICA STATICA

$$\bar{\sigma} = \frac{M_t \cdot D/2}{\frac{\pi(D^4 - d^4)}{32}} = 176 \text{ MPa}$$

PLASTICIZZAZIONE FIBRE PIU' SOLLECITATE

$K_s = K_T$ $r/d = 0.017$ $D/d = 1.33$ $K_T = 2.2$

$$\bar{\sigma}_{MAX} = K_T \cdot \bar{\sigma} = 387 \text{ MPa}$$

$$\sigma_{VM}^* = 670 \text{ MPa} \quad (\sqrt{3} \bar{\sigma}_{MAX})$$

$$\sigma_{VM}^* \leq \frac{R_s}{\eta} \quad \eta = 1.02$$

PLASTICIZZAZIONE TOTALE

$K_s = 1$

$$\sigma_{VM}^* = \sqrt{3} \bar{\sigma}^2 = 305 \text{ MPa}$$

$$\sigma_{VM}^* \leq \frac{R_s}{\eta} \quad \eta = 2.2$$

SEZIONE K-K VERIFICA A FATICA

$$\bar{\sigma}_m = \frac{M_t \cdot D/2}{\frac{\pi(D^4 - d^4)}{32}} = \frac{6000000 \cdot 80/2}{\frac{\pi(80^4 - 40^4)}{32}} = 64 \text{ MPa}$$

N.B. $\bar{\sigma}_m$ E' COSTANTE

$$M_{R\text{-K-K}} \approx \frac{20000}{2} (250 - 50) = 2000000 \text{ Nmm}$$

$$\sigma_a = \frac{2000000 \cdot 80/2}{\frac{\pi(80^4 - 40^4)}{32}} = 42 \text{ MPa} \quad \text{COMPONENTE ALTERNATA}$$

$r/d = 0.1$ $D/d = 1.25$ $K_{t,R} = 1.7$ $K_{t,T} = 1.35$

$q = 0.9$ $b_2 = 0.85$ $b_3 = 0.85$

$$K_{R,R} = 1 + q(K_{t,R} - 1) = 1.63$$

$$\sigma_{FAR}^I = \frac{R_m/2 \cdot b_2 \cdot b_3}{K_{R,R}} = 199 \text{ MPa}$$

$$\bar{\sigma}_{LIM} = \bar{\sigma}_{SN} = \frac{R_s}{\sqrt{3}} = 395 \text{ MPa}$$

$H = 0.504$

$$\sigma_{6P}^* = \sqrt{\sigma_a^2 + H^2 \bar{\sigma}_m^2} \leq \frac{\sigma_{FAR}^I}{\eta}$$

$$\sigma_{6P}^* = \sqrt{42^2 + 0.25 \cdot 64^2} = 53 \text{ MPa}$$

$\eta = 3.7$