ANSWERS KEY _ Hw3

1) $a) FS_t = 2.35 \qquad b)\ FS_s = 1.58$

2) $\sigma'_y = 40Mpa\ ;\ \tau = 1.39\ Mpa\ ;\ \tau' = 20.4\ Mpa$

3) Point A

$$\sigma_x = 12.5Mpa\ ;\ \sigma_y = -0.1\ Mpa\ ;\ \tau = 6.3\ Mpa$$

Point B

$$\sigma_x = 12.5\ Mpa\ ;\ \sigma_y = 12.68\ Mpa\ ;\ \tau = 0$$

4) $$y(x) = \frac{-2*w*\frac{x^5}{L}+9*w*L*x^3-7*w*L^2*x^2}{240*EI}$$

5) $$\delta_m = 0.273 * \frac{P*L^3}{EI}$$

6) $$R_A = R_{\boldsymbol{B}} = \frac{w*L}{2}$$

$$N_A = N_{\boldsymbol{B}} = \frac{q*L}{2}$$

$$M_A = M_{\boldsymbol{B}} = \frac{w*L^2}{12}$$

$$\delta_{\boldsymbol{max}} = -\frac{w*L^4}{384*EI}$$

$$F_{bolt} = 3164\ N\ ;\quad D = 8.98\ mm \approx 9\ mm$$

1) Point H

$\sigma_H = 0\ ;\ \tau_H = 24.25\ Mpa$

Point

$\sigma_K = 62.54\ Mpa\ ;\ \tau_K = 21.38\ Mpa$

2) $\tau_b = 60.1\ Mpa$

3) $\sigma_A = -\frac{8181.71}{t} Mpa\ ;\quad \sigma_B = \frac{10540}{t}\ Mpa$

4) $F_A = 8.8\ kN\ ;\ F_B = 2.53\ kN\ ;\ F_C = 4.86\ kN$