Homework n. 6

Determine the maximum horizontal and vertical displacement of the center of gravity of an engine located on foundation block cast from reinforced concrete. The weight of the engine is 6000 kg, the moment of inertia 1200 kg m^2, the weight of unbalanced mass is 180 kg, the eccentricity of the unbalanced mass is 0,2 mm, the frequency (not circular frequency) is 25 Hz and the distance of the center of gravity from the bottom surface of the engine is 70 cm. The density of reinforced concrete is 2500 kg m^{-3}. The stiffness of a single spring is 1090,9 kN/m and the reduction coefficient is $\psi=0,7$. Scheme of the block and engine is depicted in figure.