

The content of the final report on Dynamics

version 1:

1. Calculation of the parameters: n_d , n_h , n_g , n_{gd} ,
2. Calculation of inertia matrix **B**,
3. Calculation of the stiffness matrix **K**,
4. Calculation of flexibility matrix **D**,
5. Check No 1: check whether the equation is true: $\mathbf{K D} = \mathbf{D K} = \mathbf{I}$
6. Solution of eigenproblem (one method, the preferred way is to use the stiffness matrix)
 - a. specify angular eigenfrequencies|eigenfrequencies $\omega|f$ [rad/s | Hz]
 - b. sketch out the eigenforms
7. Check No 2, check whether the equations are true
 - a. $\mathbf{W}^T \mathbf{K W} = \text{diagonal matrix}$
 - b. $\mathbf{W}^T \mathbf{B W} = \text{diagonal matrix}$
8. Forced vibration solution without damping (one method: applying Displacement Method (**K**) or Force Method (**D**), applying the direct method or the modal transformation method).
 - a. sketch the diagrams of the bending moment: sine part, cosine part, amplitude of the moments
 - b. calculate the amplitude of vibration
 - c. points a) and b) should be calculated for the given two different excitation frequencies.

version 2 (for people who do not want to use the Displacement Method):

1. Calculation of the parameters: n_d , n_h , n_g , n_{gd} ,
2. Calculation of inertia matrix **B**,
3. Calculation of the flexibility matrix **D**,
4. Solution of eigenproblem
 - a. specify angular eigenfrequencies|eigenfrequencies $\omega|f$ [rad/s | Hz]
 - b. sketch out the eigenforms
5. Check No 1, check whether the equations are true:
 - a. $\mathbf{W}^T (\mathbf{D})^{-1} \mathbf{W} = \text{diagonal matrix}$
 - b. $\mathbf{W}^T \mathbf{B W} = \text{diagonal matrix}$
6. Forced vibration solution without damping (applying two methods: 1. the direct method, 2. modal transformation method).
 - a. sketch the diagrams of the bending moment: sine part, cosine part, amplitude of the moments
 - b. calculate the amplitude of vibration
 - c. points a) and b) should be calculated for the given two different excitation frequencies.
7. Check No 2, compare the results obtained by the direct method and by the modal transformation method.