MECA H 303:
Kinematics and dynamics of machines

Partim: Dynamics and vibrations

Introduction

Exercise session 1: 30/11

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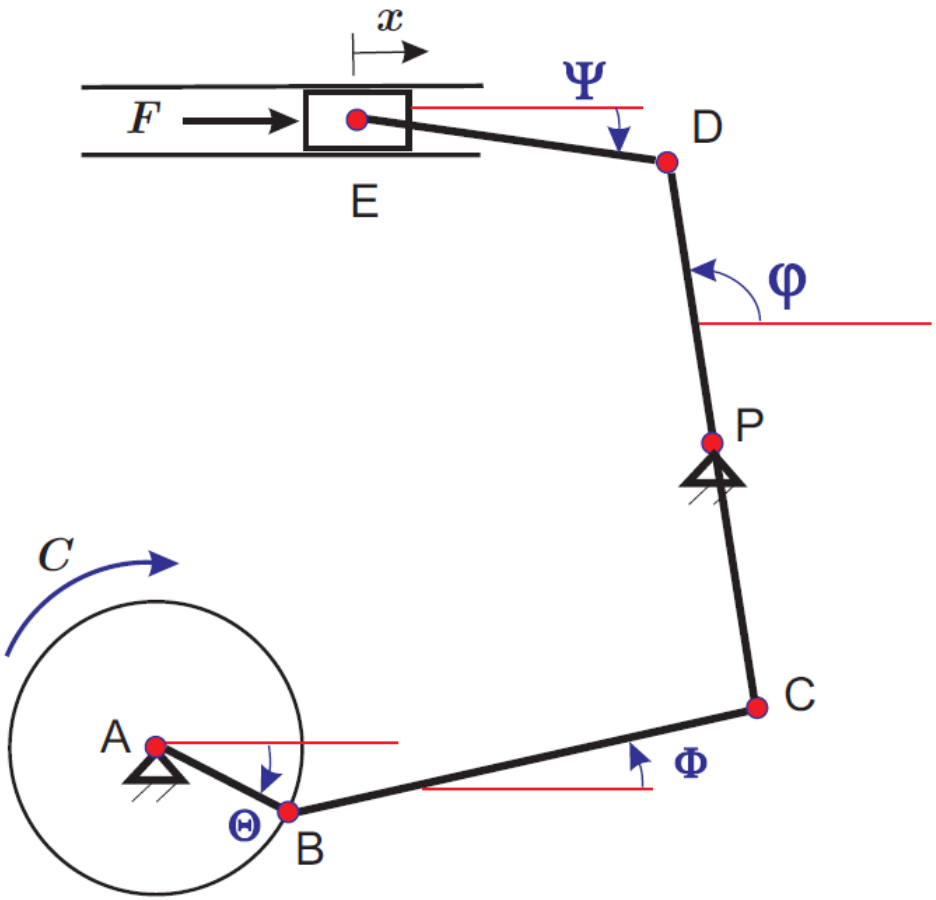
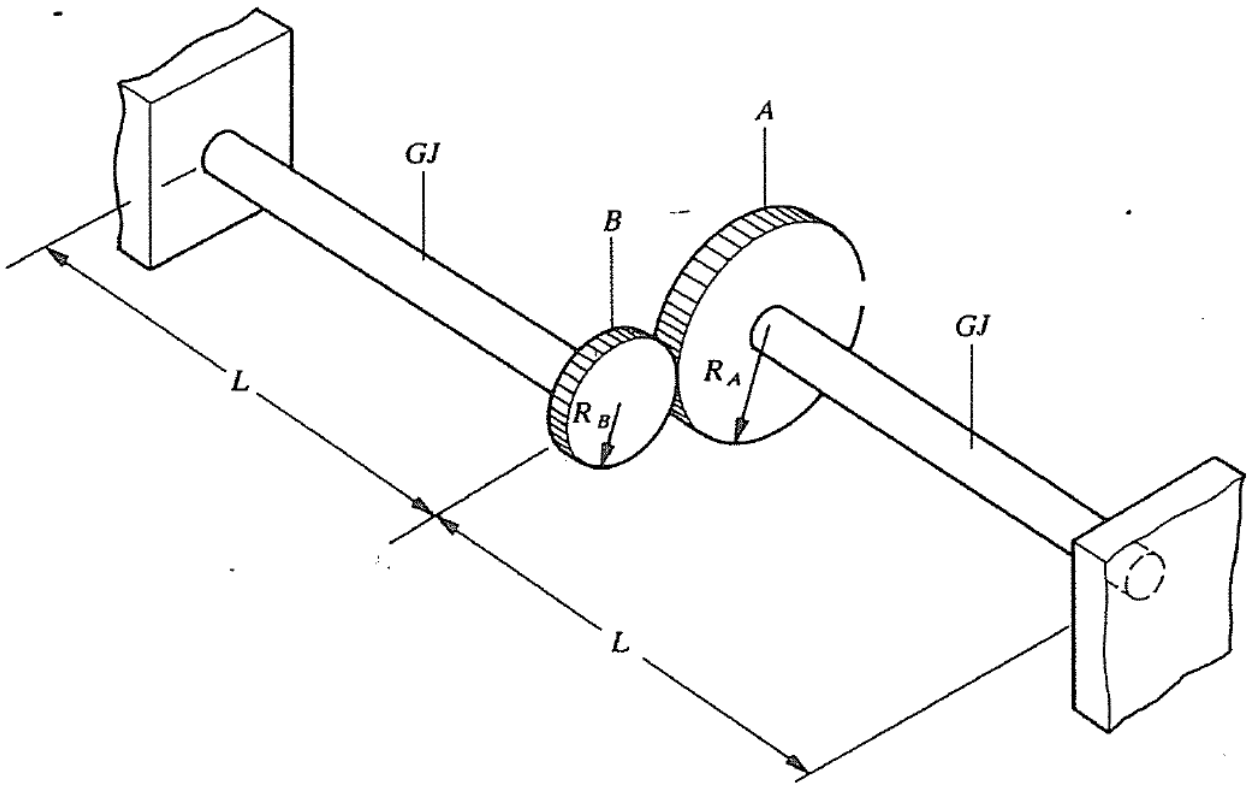
P1.1



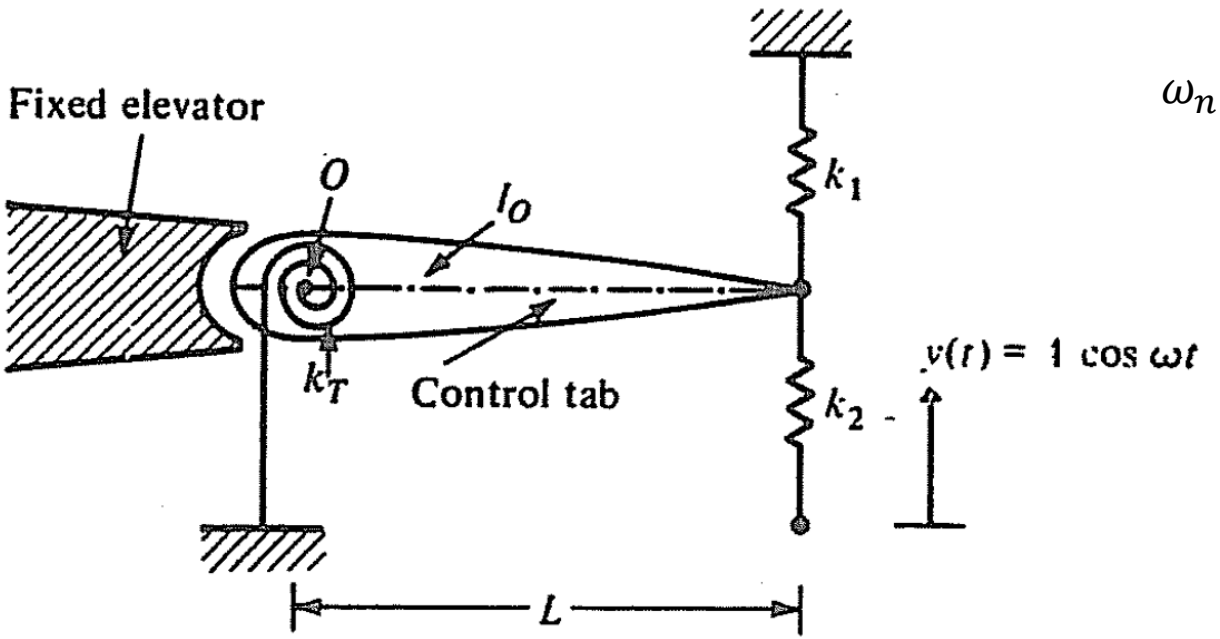
- Calculate number of degrees of freedom
- Write the constraint equations
- Using the virtual work principle express the ratio between the force and the torque applied as a function of the system coordinates

P1.2



- Derive the differential equation of the system
- Determine the natural frequency of the system
- Mass moments of Inertia I_A and I_B
- $R_A / R_B = n$

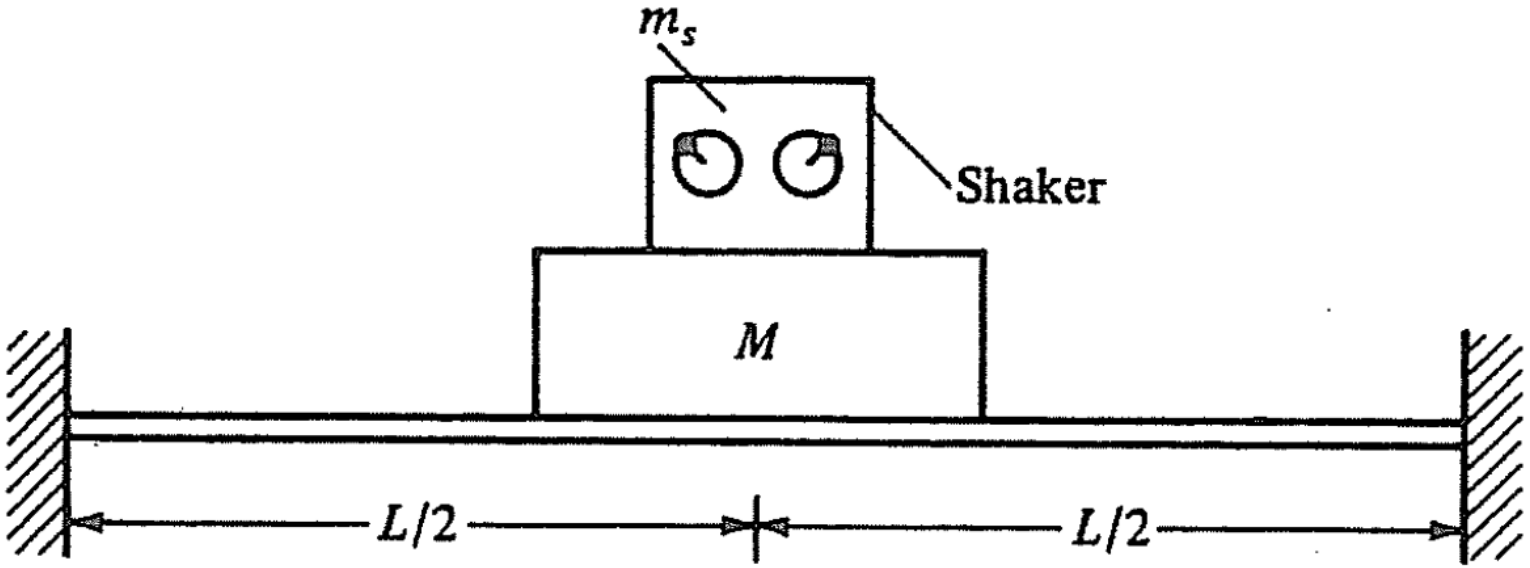
P1.3



$$\omega_n = \sqrt{\frac{k_T}{I_o}}$$

- The control tab is attached to two springs, one of which is excited until the resonant frequency of the system is reached (ω_r)
- Calculate the natural frequency ω_n of the control tab in terms of the parameters of the experimental set-up and ω_r

P1.4



- A shaker with two counter-rotating unbalanced masses on a mass resting on a massless elastic floor
- Calculate the magnitude of the response as a function of the excitation frequency of the shaker