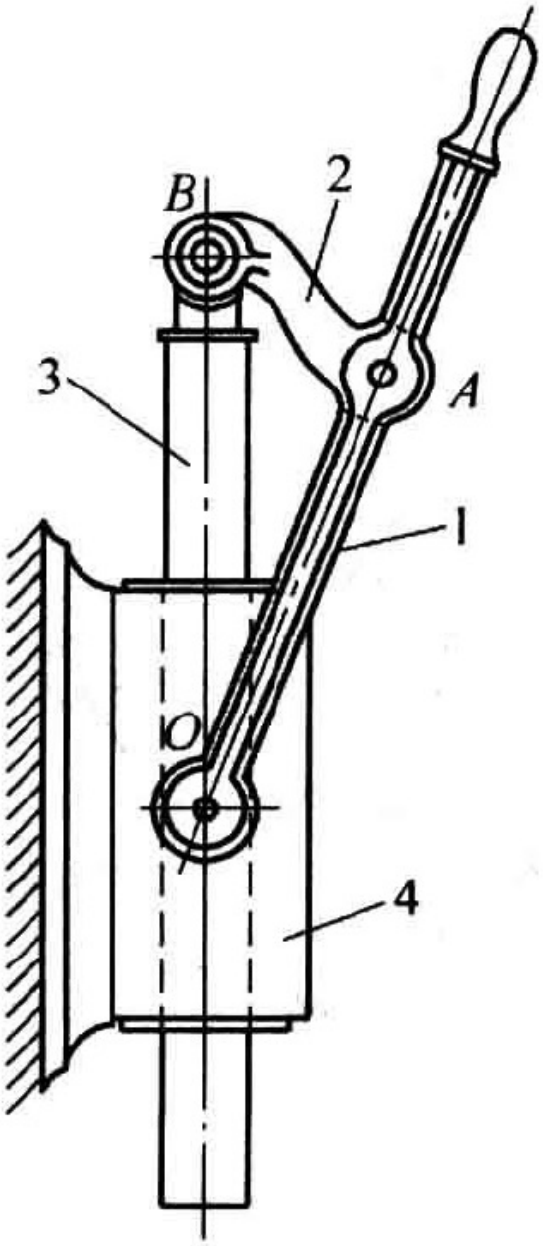
HW01
第01章 机械设计总论
作业

所有作业要求手写

Autumn 2024

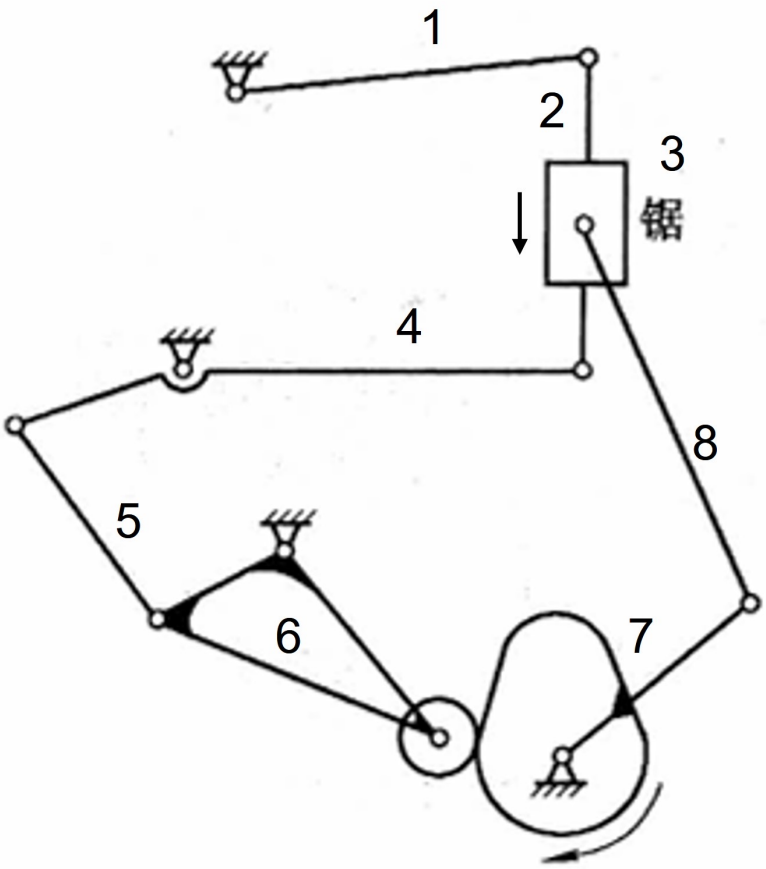
HW 01.1

- 绘制出图示机构的运动简图
- Sketch the kinematic diagram



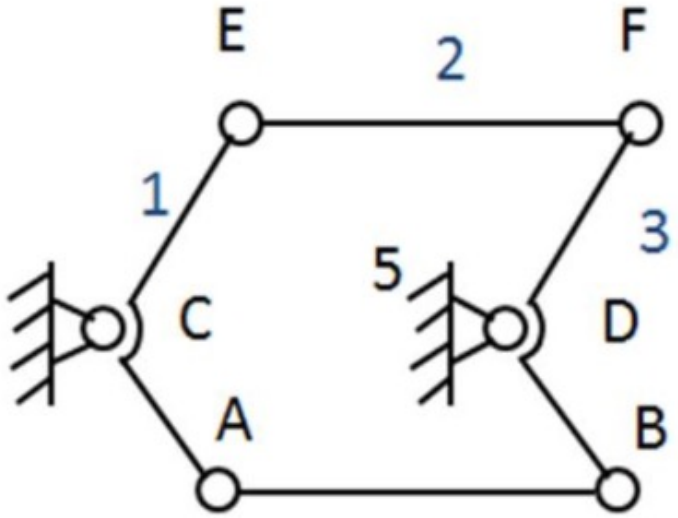
HW 01.2

- 计算图中机构的自由度
- Calculate the degree of freedom



HW 01.3

- 试计算图示机构的自由度。若有局部自由度、复合铰链和虚约束，需在图上指出。
- Try to calculate the degrees of freedom. Identify if there are any local degrees of freedom, composite hinges and virtual constraints on the diagram.



HW 01.4

- 已知某钢材的力学性能为 $\sigma_{-1} = 500$ MPa，$\sigma_s = 1000$ MPa，$\sigma_0 = 800$ MPa。
  1) 试按比例绘制该材料的简化疲劳极限应力图；
  2) 由该材料制成的零件，承受非对称循环应力，其应力循环特性 $r = 0.3$，工作应力 $\sigma_{max} = 800$ MPa，零件的有效应力集中系数 $k_\sigma = 1.49$，零件的尺寸系数 $\varepsilon_\sigma = 0.83$，表面状态系数 $\beta = 1$，按简单加载情况在该图中标出工作应力点及对应的极限应力点；
  3) 判断该零件的强度是否满足要求。
- The mechanical properties of a certain steel material are known as: $\sigma_{-1} = 500$ MPa, $\sigma_s = 1000$ MPa, $\sigma_0 = 800$ MPa.
  1) Draw a simplified fatigue limit stress diagram for the material based on proportional values.
  2) A part made from this material is subjected to non-symmetric cyclic stress. The characteristics of the stress cycle are $r = 0.3$, the working stress is $\sigma_{max} = 800$ MPa, the effective stress concentration factor of the part is $k_\sigma = 1.49$, the size factor of the part is $\varepsilon_\sigma = 0.83$, and the surface condition factor is $\beta = 1$. Indicate the working stress point and corresponding limit stress point on the diagram under simple loading conditions.
  3) Determine whether the strength of the part meets the required standards.

Thank you~

所有作业要求手写

Autumn 2024

附加题 01.1

- 相同材料、相同截面积的空心方管和实心圆棒哪个在轴向上更抗拉?

关于附加题的批改与答疑，请联系：
- 许戎汉：11810502@mail.sustech.edu.cn
- 黄国靖：12111820@mail.sustech.edu.cn