«Introduction to Mechanical Engineering»
Quiz 1

Task 1

1. What does it mean? You should explain each part of this notation (fig. 1).
2. Using which 4 basic operations you can design almost any solid part in CAD. Explain your choice with an example.

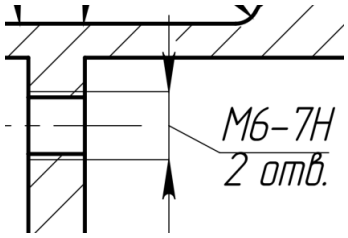

Figure 1: Task 1.1

Task 2

1. What the difference between lower and higher kinematic pairs and. Provide examples of both types, using kinematic scheme notation.
2. Draw a kinematic scheme of the mechanism (fig. 2).

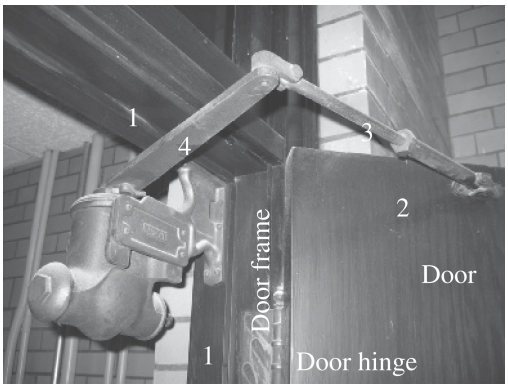

Figure 2: Task 2.2

Task 3

1. Provide at least 4 types of drives. Prof and cons.

Task 4

1. Why do we need bearings?
2. How to fix radial bearing on a shaft. At least 2 possible ways.
3. Locating and floating bearings. What the idea besides it?

Task 5

1. Could you name all highlighted parts from the picture (fig. 3)?

2. What the difference between bolden and direct extruders.
3. Could you write the printing process, starting that you have *ideal* CAD model in «step» format.

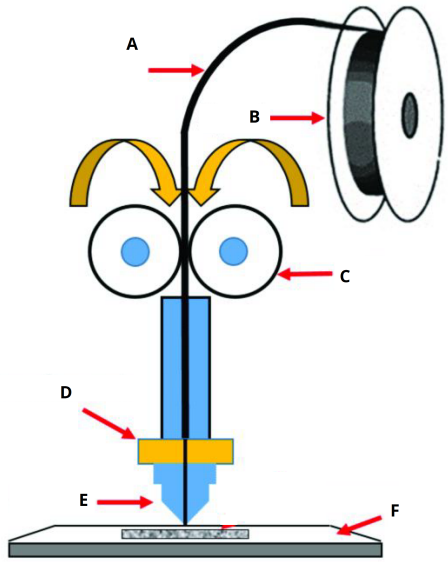

Figure 3: Task 5.1

Task 6

1. What does stress and strain mean? Stress-strain curve. What the idea besides it? Draw some curve for ductile and brittle material. How can we modify a curve behavior for some particular material?
2. Why do we need alloying elements? Could you provide at least 1 example?
3. Iron-Carbon Phase Diagram (fig. 4). What can you understand from the diagram?

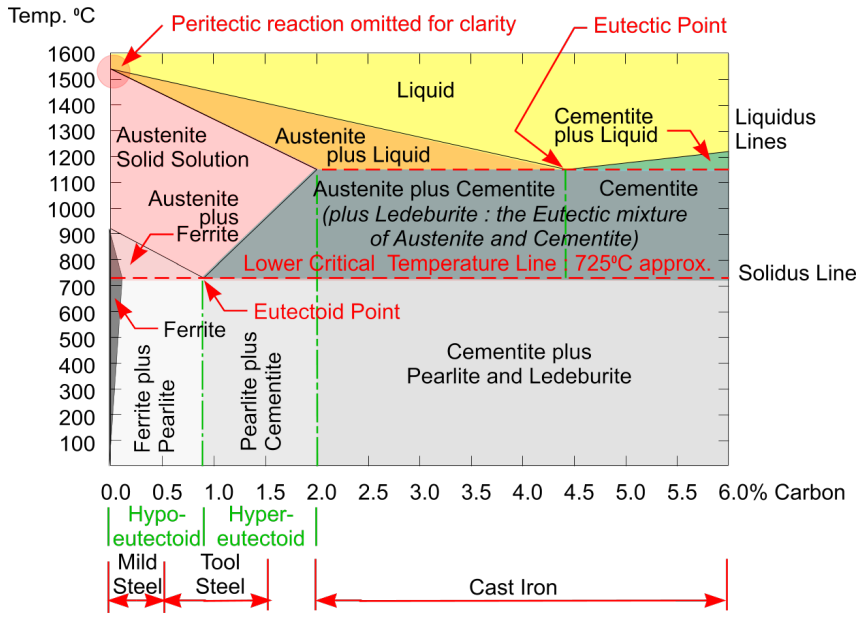

Figure 4: Task 6.3