# Final exam questions

Subject group name: **Metal Forming**

Neptun code: ZVEGENTAGMF

Credit points: 4

Subject(s) in this subject group:

- **Metal Forming** (BMEGEMTAGE1)

Program: Mechanical Engineering, BSc (2NAAG0)

Specialization(s): Engineering Design and Technology

Responsible person(s):


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  Faculty of Mechanical Engineering


You can check the current subject forms at the Educational Portal of the Faculty of Mechanical Engineering.

https://oktatas.gpk.bme.hu/

Always check for updates at edu.gpk.bme.hu before preparing for the exam, especially if the subject group contains at least one subject from your final semester!

**Valid from 31 January 2024**

*Levente Katula, PhD*

associate professor

# Questions

1. Strain and stress quantities used in the design of metal forming technologies, including the equivalent values and flow criteria.
2. Define the flow stress, draw a cold forming and a hot forming flow curve, and explain their characteristics. How the flow stress can be measured?
3. Compare the cold and hot forming techniques and list the advantages and disadvantages of both techniques.
4. Describe the Coulomb and Kudo (shear) friction model. When can they be used and why? How are the friction coefficients measured?
5. What are the roles of the lubricant? What requirements must be met?
6. Explain the anisotropy in metals. What is the origin of anisotropy? How the anisotropy can be numerically characterized?
7. What is the formability limit of metals? What factors influence the formability?
8. Describe the steps of surface treatment of a workpiece before and after the forming operations.
9. What are the main force and work calculating methods for the bulk forming techniques?
10. Explain the extrusion techniques by schematic figures and description. List the possible manufacturing defects and give a solution to them.
11. Describe the material flow in conical dies to explain the differences between wire/rod drawing, reduction, and forward extrusion.
12. What is the principle of the open and closed die forging? What are the steps of the closed die forging technology?
13. Explain the technique of deep drawing by a schematic figure and description. What defects can occur and what are the solutions?
14. Bending technology of strips, sheets, and pipes.
15. Technique and tooling of punching, blanking and fine blanking.
16. Typical machine groups used for metal forming and their characteristic restrictions.