

State exam

Manufacturing technologies 3.

1. Describe the technology of water cutting! List the benefits of the application in production and introduce related products!
2. Describe the technology of laser cutting! List the benefits of the application in production and introduce related products!
3. Describe the technology of wire cut EDM! List the benefits of the application in production and introduce related products!
4. Describe the technology of die-sinking EDM! List the benefits of the application in production and introduce related products!
5. Describe the technology of injection molding! List the benefits of the application in production and introduce related products!
6. Describe the composite production technologies! List the benefits of the application and introduce related products!
7. Describe the thermoforming, moulding, and the technology of calendering in case of plastics! List the benefits of the applications and introduce related products!
8. Describe the technology of powder metallurgy! List the benefits of the application and introduce related products!
9. Describe the material structure properties related to ceramics and the relevant technologies of their production! List the benefits of the application and introduce related products!
10. Describe generally the rapid prototyping technologies and the history of the development! Please introduce the SLA, SLS 3DP and Polyjet technology!
11. Describe and introduce the development of technologies through FDM and DMLS (DMP / LDM) technologies! Describe how rapid prototyping affects other manufacturing technologies.
12. Describe the production technology of printed circuit boards.
13. Describe the technology of inserting and soldering of electronic components into a PCB!
14. Describe the surface treatment technologies! Which technology do we use when and why?
15. Describe the properties of adhesives and the curing mechanism! What are the typical uses of adhesives in industrial practice and what type of adhesives do we use?

Manufacturing technologies 4.

16. Explain why was created the Industry 4.0 (I4.0) concept! What are its general characteristics, what are the main trends besides this?
17. Describe the general structure, types and layout possibilities of the FMS systems.
18. Introduce the situation and basics of Robotics! What are the typical robot types and what development trends (eg cobots) are characteristic of the sector!
19. Describe the technical development of the effectors! What types of humanoid gripping systems have been developed, and what are the theoretical approaches to robot programming?
20. Explain the logistics (automated warehouses, AGVs, JIT) and management supporting modern production technology! (Lean, 5S, TPM)
21. Introduce the tasks and possibilities of MES / CIM systems in production environment!
22. Explain the essence of fine programming. What are the main rules? Demonstrate its use through an example!
23. Sensors, data transmission in the field of manufacturing technology. Describe the production line data collection system!
24. Bigdata and Data mining: what do we mean, what are the problems, how to deal with them?
25. IT security: from the basics to protecting our virtual manufacturing system. Which privacy concepts exist? Which ones can be used in manufacturing systems?
26. Application of agility and scrum framework in technical development. Describe the development guidelines used in information systems.

Introduction of technologies:

- classification, field of application
- historical overview (in brief)
- process, diagram, description
- raw materials, workpieces
- relevant technological parameters
- advantages disadvantages
- limits
- technology environment
- specialties
- procedure variants - modern versions