VSB TECHNICAL UNIVERSITY OF OSTRAVA | FACULTY OF MECHANICAL ENGINEERING

Questions for the state final exam

Master study programme N0715A270022 – Engineering Technology,

academic year 2022/2023

ENGINEERING TECHNOLOGY

AND PRODUCTION MACHINES

1. Machine tools for rotating parts.
2. Machine tools for non-rotating parts.
3. Multifunctional machine tools, high-speed machine tools, and other machine tools (boring, grinding, toothing, heavy).
4. Inspection and diagnostics of the machine tool.
5. Classification of additive technologies according to ISO/ASTM 52900:2015.
6. Materials for additive technologies.
7. Post-process modifications of models produced by additive technologies.
8. Additive manufacturing process.
9. Technologicality of forgings and flat mouldings construction – advantages and objectives of die forging, relation of production size and cost size, basic principles of technologicality of forgings construction, prediction of lifetime of forming tools, advantages and objectives of flat forming, minimisation of consumption of flat blanks, technologicality of bent parts construction, measures eliminating suspension, technologicality of sheet metal stampings construction.
10. Welded steel and aluminium constructions – types of steel and aluminium constructions, materials for steel and aluminium constructions, division according to the method of stressing, types of welding joints used, differences between the design of steel and aluminium constructions.

11. Pressure vessels and construction of concrete reinforcements – types and structural solutions of pressure vessels and concrete reinforcements, methods of stressing pressure vessels, used materials of pressure vessels and concrete reinforcements. Design of welding joints and welding methods.

12. Other types of constructions – constructions made of plastics, glued constructions, constructions of ships, aeroplanes and cars – types of welded and glued joints used, methods of joining homogeneous and heterogeneous joints of materials, service life of joints.

13. Laser, plasma, electron beam welding – possibilities of technology, principle of the method, welded materials, advantages and disadvantages of technology. Plasma and laser thermal separation – technological possibilities, advantages and disadvantages of technology.

14. Resistance welding, cold pressure welding, friction welding – the principle of the method and technological possibilities, welded materials, advantages and disadvantages of technology.

15. Electroslag welding, explosion welding, diffusion welding, bolt welding, ultrasonic welding, plastics materials welding, advantages, disadvantages and possibilities of technology.

16. Welding of worn surfaces, thermal spraying, WAAM (Wire and Arc Additive Manufacture) – 3D printing, advantages and disadvantages of technology.

17. Mechanical surface pre-treatment, chemical surface pre-treatment.

18. Physical plating – PVD, and physical-chemical plating – CVD.

19. Thermal spraying – metallisation, hot dip galvanising – zinc.

20. Inorganic coatings – enamels, organic coatings – paints.