

2021.
Topics of final exam

Automatic production systems

- Structure of classical process control systems and their features and their historical review.
- Applied control algorithms in classical control systems, such as position and speed algorithms. Limits.
- Subsystem in production systems their role and their features.
- Material handling subsystem and its features. Working of the applied devices.
- Material handling subsystem and its features. Conveyor belts, materials, mechanical structures, driving.
- Classification of processing subsystems and their main features.
- Parts of mechanical production systems, CNC machines and their features.
- CNC lathe, CNC milling machines and multi-axis manufacturing cells. Software questions.
- Philosophy of flexible production system and cell. Parts of production cells.
- Machines of electrical production, their working principles and their features. Parts of SMT line.
- Testers of electrical productions.
- Informatics in production systems, their role and place in company.
- Role of information system in a company and their structure.
- Scheduling problems. Basic idea, roles and application of just-in-time scheduling.
- Scheduling problems. Analysis serial – parallel – serial case.
- Fuzzy sets and their operations. Fuzzy relations.
- Fuzzy decisions and comparison of them.
- Electrical drives used in production systems.
- Pneumatic elements, valves, cylinders, turning machine and their features and application.
- Binary sensors, working methods, usage, signal levels.
- Definition of the industrial robot, their application. Kinematic chain.
- Structure of the industrial robot. Mechanical parts, sensors.
- Grippers and tool are used in industrial robots.
- Phenomenon of embedded systems and their structures.
- Features of real-time systems and their implementation. Hard and soft real-time systems.

- Architectures of processor based systems. Features of these systems and their implementation.
- Structures and features of multiprocessor systems. IO and memory coupled systems.
- Hardware description language. VHDL.
- Phenomenon of computer network, and their implementation.
- OSI model and its features. Features and tasks of the layers.
- Safety question of computer networks.
- Structures of industrial networks. Implementation of the layers.
- Technology-near-buses used in industrial networks. RS485, CAN