Lista zagadnień na egzamin dyplomowy

Kierunek studiów:	**Automatyka i Robotyka**	Stopień studiów:	**pierwszy**
Specjalność:	**Automatyka**		

Nr	Zagadnienie
1	Ways to pass arguments to functions in C++. **[Information engineering]**
2	The role of the IP address in network communication. **[Information engineering]**
3	Basic laws of electrical engineering. **[Electrical engineering]**
4	Conservation laws in physics. **[Physics]**
5	Basics of wave optics (interference, diffraction, polarization). **[Physics]**
6	Parameters of random signals. **[Signals and dynamic systems]**
7	Fourier transformation - its physical meaning and properties. **[Signals and dynamic systems]**
8	Controllers and control performance in a closed-loop system. **[Automatic control]**
9	Stability of linear continuous-time systems. **[Automatic control]**
10	Modelling of dynamical systems in discrete-time. **[Automatic control]**
11	Sampling versus control performance and properties of a model. **[Automatic control]**
12	Effects of presence of nonlinearities in control systems. **[Automatic control]**
13	Programming model for real-time systems. **[Real-time systems]**
14	Process synchronization and communication mechanisms. **[Real-time systems]**
15	Measurement uncertainty. **[Metrology]**
16	Sensors and transducers of non-electrical quantities. **[Metrology]**
17	Software and hardware implementation of combinational circuits. Minimization of logical expressions. **[Microprocessor systems]**
18	Software and hardware implementation, incl. multiplexers, demultiplexers, flip-flops and memory; software and hardware implementation of sequential circuits. **[Microprocessor systems]**
19	Peripheral systems (GPIO, TIM, ADC, DAC) of the microcontroller, their operation and hardware interfaces. **[Microprocessor systems]**
20	PWM with analog filter as an analog output, PWM for analog signal optoisolation, signal generation, calibration problem. **[Microprocessor systems]**
21	Direct and Inverse kinematics of robot manipulators. **[Robotics]**
22	Classification of methods for solving inverse kinematics of robot manipulators. **[Robotics]**
23	Robot control methods. **[Robotics]**
24	Design and manufacturing process of the Printed Circuit Board (from concept to manufacturing, assembly and testing). **[Electronical and electrical circuits designing]**
25	Basic system identification methods for ARX and OE structures (including model order estimation). **[System identification]**
26	Identifiability and parameter estimation in a closed-loop system. **[System identification]**
27	Determining models in the state space. **[Control theory]**
28	State observers. **[Control theory]**
29	Principle of operation of basic functional blocks of programmable controllers, timers and counters. **[Digital controllers and PLC]**
30	Cycle of operation of a programmable controller. **[Digital controllers and PLC]**
31	Data description in JSON. Complex data structures. **[Mobile and embedded applications for the Internet of Things]**
32	Web interface architecture. Implementation of server side (e.g. using PHP) and implementation of client side (HTML, JS and requests of HTTP). **[Mobile and embedded applications for the Internet of Things]**
33	Basic concepts in project management. **[Project management]**
34	Scalar and vector control of AC induction motors. **[Control of motion and electric vehicles]**
35	Cascade control of position, speed and current of the electric drive - influence of limitations on output signals. **[Control of motion and electric vehicles]**
36	Advanced control structures (2DOF, Smith predictor, internal model control, predictive model control, artificial neural networks). **[Analysis of control systems]**
37	Numerical modelling of dynamic objects. **[Analysis of control systems]**
38	Modelling of the time delay. **[Analysis of control systems]**

39	Types of production and concepts of their automatization. **[Flexible manufacturing systems]**
40	Petri nets. **[Flexible manufacturing systems]**