

### **Section 1. INFORMATICS AND PROGRAMMING**

Submission of alphanumeric information. Numeration systems. Direct, reverse, additional codes. Numbers from the fixed and floating comma. Operations with binary arithmetic. Concept of an algorithm. Algorithmic systems. General structure of algorithms. The linear structure of programs. Branching. Cycles. Procedural, the functional, logical and object-oriented programming.

### **Section 2. ELECTRONICS AND AUTOMATION TECHNOLOGY**

Structure and parameters of operational amplifiers. The ideal operational amplifier with negative feedback. Adders on operational amplifiers. The integrator on the basis of the operational amplifier. The active filters. The operational amplifier with the positive back coupling. Multiplication-division devices. Basic logical elements. Three-stable logical element. Decoders. Multiplexers. Triggers. Impulse meters. Registers. Digital-to-analog converters. Analog-to-digital converters. Storage devices. Programmable logic arrays. Switches of analog signals. Conversion methods of temperature to an electrical signal. Conversion methods of force to an electrical signal. Conversion methods of mechanical displacement to an electrical signal. Conversion methods of an electrical signal to mechanical displacement.

### **Section 3. AUTOMATIC CONTROL THEORY**

Forms of record of differential equations of control systems. Transfer functions. The proportional system. The differentiating systems. The forcing systems. The first order system. The second order system. Time response characteristics. The frequency responses. Concept of stability of control systems. Stability conditions of the linear control systems. Transient performance in the linear control systems.

### **Section 4. SIMULATION of CONTROL SYSTEMS**

Classification of models. Types of systems simulation. Characteristics of systems models. Requirements to system model. Stages of systems simulation. Entity of a statistical modeling method. Technical and program methods of simulation. Pseudorandom sequences and procedures of their machine generation.