<p style="text-align:center">List of the examination questions
EFFECTIVE FROM THE ACADEMIC YEAR 2021/2022</p>

Electronics
Advanced Applied Electronics (AAE)
Second level studies

Questions in the field of studies:

1. Basic features of 8-bit microcontrollers. Memories in microcontrollers and microcontrollers' peripherals.
2. ARM architecture. Cortex-M, Cortex-R and Cortex-A – features and similarities.
3. Please name key low level mechanisms implemented in DSP processor for supporting signal processing and describe the work of the selected one by the chairmen of examination board
4. Specify the role of lasers in application areas: technology, telecommunications, medicine, metrology, military etc.
5. Name and describe shortly operation principles and cardinal properties of basic analog-digital converters.
6. What are differences between operational and instrumentation amplifier?
7. Name the basic methods of eliminate interferences in electronic systems, describe briefly power decoupling techniques for PCB and features of a decupling capacitors.
8. Compare Nonnegative Matrix Factorization with Principal Component Analysis. Specify their areas of applications, give examples..
9. Blind source separation problem – assumptions, algorithms, applications.
10. What is Voltage Standing Wave Ratio (VSWR)? Please specify what values take the VSWR for the transmission line terminated with: a- short circuit, b- open circuit, c- matched load impedance?
11. Please provide definitions of the following quantities: Return, Insertion and Mismatch Losses. Specify what values in dB take the Return Loss for measured Reflection Coefficient of ½ .
12. What are the steps performed by Unix operating system to create a new process? List three (or more) possible states of created process.

Questions in the filed of studies and specialty:

1. Static optimization task types and methods of its solution.
2. Local and global optimization algorithms
3. Methods of numerical solving of differential equations.
4. Active and passive applications of ultrasound in various media.
5. Principle of laser operation, types of lasers and their basic parameters.
6. Architectures and implementations of data acquisition and processing algorithms.
7. Problems of synchronization in data acquisition and processing systems.
8. Light propagation in optical fibers, types of optical fibers, optical elements and their basic parameters.