FINAL EXAM QUESTIONS

Course: *Engineering Management (BSc)*
Subject: *Electrical Engineering*

1. Traceability and derivation of standards. Calibration of the measuring instruments, determining the calibration interval.

2. The measurements with legal effect. Legalization of measuring instruments: procedure, period of validity.

3. The main technology and testing steps in the production of electronic units, and the characterization of initial materials according to the aspects of quality assurance.

4. Testing methods, tools of testing (mechanical, electronic and IT). Measuring systems, the role of the computer in the testing.

5. The basis of medical technology: specializations, tools and quality assurance. The structure and operation of the health care system, current issues of financing.

6. Typical characteristics of medical measurement technology. The diagnostic devices of heart - electrocardiography.

7. Therapeutic devices of the heart - pacemakers and defibrillators.

8. Describe the time domain features of signals: peak and RMS value, crest factor. The decibel scale, signal to noise ratio. Describe the classification of signals according their domain and range (continuous, discrete, analog, digital). What is the difference between deterministic and stochastic (random) signals?

9. Describe the system description functions pulse and frequency response. Energy spectrum and power density function of random signals.

10. Describe the spectral analysis: Fourier transform. Spectral behaviour of square pulse and unit (Dirac) pulse, relation between pulse width and bandwidth.

11. Describe the demodulation of AM signals. Demodulation of AM-DSB signals with envelope detector. What are the limits of envelope detection?

12. What is the relation of modulation content and modulating signal in case of PM and FM? Generation and demodulation of angle modulated signals. Bandwidth of angle modulated signals.

13. What are the digital carrier systems? What are the features of ASK, OOK, FSK and PSK modulation methods? Constellation diagram of PSK signals.

14. QAM method: Describe the mathematical description, modulation and demodulation, constellation diagram and 2D eye pattern of QAM signals. Number of bits transmitted during a signalling slot.

15. What is the digital analog conversion? Sampling: The spectrum of the sampled signal and the Shannon- law for sampling frequency. Aliasing. Signal reconstruction from samples and the effect of leaking. Quantization: Quantization step and peak clipping. Quantization error and quantization noise. Linear and logarithmic quantizers.