

Physics in Clinical Physiology, Final Exam 27.4.2009, Ari Pääkkönen

1. Differences in measuring action potentials and synaptic potentials from the central nervous system.
2. Somatosensory evoked potentials.
3. Polarizable and nonpolarizable electrode.
4. Pneumotachometer
5. Define:
 - a) Hyperpolarization
 - b) Motor unit potential
 - c) Figure-of-eight coil
 - d) Electrical equivalence of compliance in a catheter-sensor system
 - e) Generation of broad band click stimuli used in auditory stimulation
6. A brave student attempts to measure ECG between his left and right hand using a differential input oscilloscope. He uses shielded cables (no coupling of power-line interference into the cables). Calculate the power-line interference the student observes if the electric field coupling between the power lines and the student results in a current of $0.3 \mu\text{A}$? The contact impedances of the hand electrodes are $20 \text{ k}\Omega$ and $10 \text{ k}\Omega$. The grounding electrode the student placed on his foot has a contact impedance of $25 \text{ k}\Omega$. The input impedance of the oscilloscope is $1 \text{ M}\Omega$.