

**SUBJECTS FOR THE *THIRD* MIDTERM TEST (Pharmacy) (20010/2011) 2nd semester
Biophysics**

Basic electronic units and circuits

voltage divider

RC circuit-elements in DC circuits

charging and discharging a serial RC circuit; parallel RC circuit

AC filter circuits, low pass filter, high pass filter; noise filtering

LC circuit (oscillating circuit)

semiconductor electrical elements, diode; FET (Field Effect Transistor)

Signals, classification of signals, signal processing

electrical amplifier, feedback; differential mode amplifier

signal conversion and signal selection; analog-digital (A/D) conversion; pulse selection

displays, mechanical writer, cathode ray tube (CRT)

Liquid Crystal Display (LCD)

Transport phenomena, flow of fluids and gases

question of incompressibility

streamlines, laminar flow, turbulent flow, volumetric flow-rate

methods for measuring the volumetric flow rate:

ultrasound methods (Doppler-examination), dilution techniques

Law of continuity, ideal and real fluids

Bernoulli's law and some consequences

Newton's law of friction, newtonian fluids

temperature dependence of viscosity (gases, fluids)

fluid flow in a tube, parabolic velocity profile

Hagen-Poiseuille law and its application to blood-circulation (conditions)

connection between Hagen-Poiseuille law's and Ohm's law

turbulent flow, Reynolds-number

Stokes' law, mobility

Diffusion

Characteristics of molecular motion

Fick's first law, diffusion coefficient, Stokes-Einstein equation

generalized equation of continuity

Meaning of Fick's second law

Random-walk problem

Osmotic phenomenon, van t'Hoff law

Topics from laboratory practices: Measurements on 1-5th weeks.

Problems: 41-44, 55, 60-61, 67, 68