

Exam questions in biophysics (practicum) (1st Faculty of the UK, UK)

Below you will find frequent and popular questions that are asked during the continuous examination of biophysics practicals.

Electricity

- draw and describe the I/t curve
- draw and describe the I/t curve of rectangular and slanted impulses, say which part of the curve we are interested in and which of the two impulses is used and why
- what is rheobase, how long does it last (catch - however long)
- what is chronaxia
- explain DD and IF currents and what they are used for
- what is impedance and how is it expressed by the formula

EKG

- draw and describe the curve
- be able to describe it even after turning 180°
- electrical line of the heart - what is it, draw, units, physiological range, where will the vector go in obese people
- the difference between the electrode and the lead
- know the types of leads, which color belongs where on the body
- drawing a unipolar lead, e.g. on the right hand (place a 5kΩ resistor in advance!)
- Einthoven's triangle

Acoustic

- decibel - what is it, how is it calculated
- what units do we use to determine the range of audibility (dB and Hz) and their range
- threshold of audibility of the human ear
- how is it with the frequency, for example, of the bass - if it has to be lowered or raised in order to be heard

Spectrophotometry

- range of visible light
- colors at the ends of the spectrum
- what is above and below the level of visible light (= know the spectrum)
- formula for calculating photon energy and wavelength

Ultrasound

- mechanic undulation
- causes micro massage
- how the image is created

Optics

- draw a hypermetropia
- eye defects, on which blurred vision is based
- Balmer and Lyman series
- Photoelectric effect
- Compton phenomenon
- define near and a far point
- what is astigmatism, how is it treated, what are the types, which is more common and which is more serious
- what is myopia and how is it treated
- beam path in an optical microscope

Heat, Temperature

- the body's thermal comfort and what affects it
- what is cat value and how is it calculated
- when do we talk about subfebrile in a patient and when about febrile
- thermodynamic temperature scale, conversion

Radiation

- what is fractionation, when is it used (irradiation of tumors) and after what doses (2Gy)
- units - Becquerel, Gray, Sievert - to which quantities belong (explain) and conversion to SI
- the principle of gamma radiation absorption

Breathing & circulation

- What is Korotkoff phenomena why, when and how it occurs, how blood flows in veins normally and what happens when measuring pressure (explain the flow of liquid in a tube)
- What is the Reynolds number, how do we calculate it and derive it
- Spirometry - what we find during which measurement, what are the results for obstruction and restriction
- chart for spirometry - vital lung capacity etc.