

# Forum:Seminar papers/Biophysics/2. LF/2017-2018/Group 4B (Isabel): MCQ - Ionizing Radiations, Biosignals

## A. Ionizing Radiations

1. Which statement is true?

a) The attenuation coefficient measured in CT imaging is a measure of how much tissue in given voxel absorbs ultrasound waves **b) Medical imaging is a visual representation of a physical variable** c) Medical imaging is a visual representation of a biological variable d) the most common MRI machine uses a magnetic field of 2,5 mT

2. The physical half life of Tc-99m is:

**a) 6 hours** b) 72 hours c) 3 days d) 50 years

3. The principle of H-NMR is based on which of the following property of protons?

a) up and down quarks **b) proton spin** c) proton charge d) atomic mass of proton

4. Which is the least dangerous medical imaging technique?

a) NMR **b) Ultrasound** c) X ray imaging d) CT scan

5. Which statement below is correct:

a) Ionizing radiation photons carry less energy than non-ionizing radiation b) x-ray radiation does not belong to ionizing radiation c) Ionizing radiation is not electromagnetic radiation **d) Gamma rays are ionizing radiation**

## B. Biosignals

1. Electric biosignals are:

a) produced by the heart b) signals created during muscle contractions c) produced in the brain **d) all of the above**

2. The biomedical signal variable may be a function of:

a) continuous signals and pulses. b) active and passive signals. c) time and measurement of voltage in electrodes. **d) time and measurement of position in the patient.**

3. Polarisable electrodes are NOT suitable for accurate measurements because:

a) they produce constant contact potential. **b) they produce variable contact bias.** c) they produce electrolytes. d) they produce no variable contact bias.

4. What are the frequencies and amplitudes of alpha and beta waves, respectively?

**a) Alpha waves: 8 - 13 Hz, 50  $\mu$ V max; Beta waves: 15 - 20 Hz, 5 - 10  $\mu$ V.** b) Alpha waves: 15 - 20 Hz, 5 - 10  $\mu$ V; Beta waves: 8 - 13 Hz, 50  $\mu$ V max. c) Alpha waves: 8 - 13 Hz, 50  $\mu$ V max; Beta waves: 1 - 4 Hz, 100  $\mu$ V. d) Alpha waves: 1 - 4 Hz, 100  $\mu$ V, Beta waves: 15 - 20 Hz, 5 - 10  $\mu$ V.

5. Artefacts are features of signals not arising from the target tissue, but either from outside the patient or:

a) from incorrect use of the measuring instrument. b) from non-targeted tissues. c) from deficiencies in the measuring instrument. **d) all of the above.**