Exam 16th of October 2014
ELT-73106, Bioceramics and Their Clinical Applications
Professor Heimo Ylänen

Scientific calculator allowed

Q1. (6p)
1.1. Describe what happens when bioactive glass is exposed to body fluids. Write and/or illustrate the way of a bioactive glass implant from intact glass to organized bone. (4p)
2.1. What kind of material is said to be bioactive? (2p)

Q2. (6p)
2.1. Describe what properties show an osteoconductive material. (3p)
2.2. Describe the different theoretical ways for a material to show osteoinductivity. (3p)

Q3. (6p)
Write about the difference between coating methods of an implant by
3.1. Flame spraying (2p)
3.2. Electrophoretic Deposition (EPD) (2p)
3.3. Discuss about the benefits/problems in both cases. (2p)

Q4. (6p)
The surface of titanium is among the most biocompatible known and widely used in biomedical devices.
4.1. Write about the properties of the surface of titanium which make it so biocompatible (2p)
4.2. and 4.3. The natural surface of titanium can be manipulated so that it turns to bioactive. Write about two different methods which result in two different bioactive bondings. Mention some clinical applications of both. (2 p each)

Q5. (6p)
What kind of bone is:
5.1. Woven bone? When/where do you see it? (2p)
5.2. Lamellar bone? When/where do you see it? (2p)
5.3. Describe the mechanical properties those two different types of bone. (2p)